SRWRS
Sacramento River Water Reliability Study

Initial Alternatives Report, Appendix D
Phase 1 Environmental Evaluation

May 2004

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SUMMARY

This appendix summarizes the Phase 1 environmental evaluation for preliminary alternatives identified in the Sacramento River Water Reliability Study (SRWRS) Phase 1 Engineering Report (see **Appendix C**), which describes each alternative, and components designated for SRWRS cost-sharing partners. Currently, cost-sharing partners include Placer County Water Agency (PCWA), Sacramento Suburban Water District (SSWD), City of Roseville (Roseville), and City of Sacramento (Sacramento).

The discussion in this appendix addresses criteria used for the evaluation; results of the modules evaluation and alternatives evaluation; and detailed potential environmental consequences (impacts), magnitude of effects (significance), known potential mitigation requirements, and recommended avoidance options for all modules of the alternatives (diversion structure, raw water pipelines, water treatment plants, and treated water pipelines). The groundwater module, which applies to only four of the alternatives (all but the Elkhorn/Elverta alternative), could not be evaluated in this phase absent modeling studies to be conducted in Phase 2.

Each module was evaluated independently for each of the resource areas under consideration, and then alternative specific combinations of modules were evaluated to arrive at a Phase 1 level comparison among alternatives.

Terminology used in this report to describe potential environmental effects, namely, "Potential Environmental Consequence" or "Magnitude of Effect," is considered to be interchangeable with "Potential Impact," "Potentially Significant Impact," or "Less Than Significant Impact" (i.e., the terminology normally used in a California Environmental Quality Act (CEQA) Initial Study—although this report is not intended to be an Initial Study). In either case, no final determination or conclusion of impact is assumed in this phase of the study and all reconnaissance-level evaluations will be thoroughly studied and documented in Phase 2.

PURPOSE OF THE PHASE 1 ENVIRONMENTAL EVALUATION

The purpose of the Phase 1 environmental evaluation includes identifying the following:

1. Alternatives that are anticipated to have substantial significant impacts that would be difficult or infeasible to mitigate and therefore should be eliminated from further consideration.

2. Potential modifications to the preliminary alternatives based on known environmental conditions resulting in avoidance of potential impacts.

3. Potential mitigation measures that can be incorporated in engineering design for any impacts.

The environmental evaluation encompasses all the modules of the alternatives, including diversions, water treatment plants (WTP), major transmission pipelines for raw and treated water, and operations (to the extent assumptions without operations data permit). Effects of using groundwater were not addressed due to the absence of necessary modeling analysis, which will be conducted in a later phase of the study. The level of analysis in this phase is similar to that of an Initial Study under CEQA. For the purposes of the Phase 1 environmental evaluation, levels of magnitude of effect for major resources areas (i.e., "high," "medium," or "low") are preliminarily identified.

PRELIMINARY ACTION ALTERNATIVES

This section summarizes preliminary action alternatives identified prior to the SRWRS scoping process. Additional details of these facility plans are provided in **Appendix C**. Development of these alternatives is

documented in **Appendix B**. The No Project/No Action Alternative is not included in the Phase 1 environmental evaluation.

Among these action alternatives, the Elkhorn/Elverta Diversion Alternative is the only alternative currently under consideration that can accommodate all cost-sharing partners in a comprehensive plan with a single diversion location. In other action alternatives, cost-sharing partners share facilities to a greater or lesser degree. Therefore, facility modules, subsets of an alternative, are used in the discussion to properly characterize the results of environmental evaluation. Each facility module contains a complete plan for diversion, treatment, storage, and transmission facilities for one or more cost-sharing partners.

- **Elkhorn/Elverta Diversion Alternative:** This alternative has diversions for all cost-sharing partners at a single location; therefore, no separate module is included in this alternative.

  This alternative encompasses constructing a joint diversion from the Sacramento River and treatment facilities to serve the cost-sharing partners. The diversion facility would consist of expanding the existing Elkhorn Diversion[1] owned by the Natomas Mutual Water Company (NMWC) on the east bank of the Sacramento River, upstream of the mouth of the American River, or constructing a new diversion near the existing Elkhorn Diversion (Elverta Diversion) within 2 miles upstream. Water treatment, storage, and pumping facilities would be located near the river. Also, a transmission line would connect to the west end of the existing Cooperative Transmission Pipeline/Northridge Transmission Pipeline in Antelope to serve SSWD, and an extension of that line would be built north to the service areas of Roseville and PCWA. A separate transmission line would extend south to connect to Sacramento's existing distribution system.

- **Sankey Diversion Alternative:** This alternative contains two modules, one for PCWA, SSWD, and Roseville, and one for Sacramento.

  - **Sankey Module:** PCWA, SSWD, and Roseville would divert water from the Sacramento River near the confluence of the Sacramento River and the Natomas Cross Canal (NCC) and build separate treatment, storage, and transmission facilities to meet their needs. This diversion would be located at or near the second diversion that NMWC is developing under its CALFED-supported diversion consolidation effort.[2]

  - **Elkhorn/Elverta Module:** Sacramento would use groundwater to meet projected unmet demand or would divert separately from the Sacramento River at the Elkhorn/Elverta site, as described in the Elkhorn/Elverta Diversion Alternative, and would construct its own treatment and transmission facilities to serve its needs.

- **Feather River Diversion Alternative:** This alternative contains two modules, one for PCWA, SSWD, and Roseville, and one for Sacramento.

  - **Nicolaus Module:** PCWA, SSWD, and Roseville would divert water from the Feather River near Nicolaus and build separate treatment, storage, and transmission facilities to meet their needs.

  - **Elkhorn/Elverta Module:** Sacramento would use groundwater to meet projected unmet demand or would divert separately from the Sacramento River at the Elkhorn/Elverta site, as

[1] The SRWRS and NMWC American Basin Fish Screen and Habitat Improvement Project are two separate projects with distinct planning and environmental processes.
[2] Ibid.

described in the Elkhorn/Elverta Diversion Alternative, and construct its own treatment and transmission facilities to serve its needs.

- **American River Pump Station (ARPS) Alternative:** This alternative contains four modules for PCWA, SSWD, Roseville, and Sacramento, representing the most diverse alternative components among all action alternatives.

    - **ARPS Module:** PCWA would expand its American River Pump Station near Auburn and expand currently planned treatment and transmission facilities to serve its needs.

    - **Folsom Dam Module:** SSWD would divert from the existing San Juan Water District (SJWD) diversion facilities at Folsom Dam using shoulder capacity of existing facilities.

    - **Groundwater Module:** Roseville would increase use of groundwater to satisfy its needs in this alternative but would not have any additional surface water diversions.

    - **Elkhorn/Elverta Module:** Sacramento would use groundwater to meet projected unmet demand or would divert separately from the Sacramento River at the Elkhorn site, and construct its own treatment and transmission facilities to serve its needs.

- **Folsom Dam Alternative:** This alternative contains three modules, one for PCWA and SSWD, one for Roseville, and one for Sacramento.

    - **Folsom Dam Module:** PCWA and SSWD would use the existing or expanded diversion, treatment, and transmission facilities of SJWD at Folsom Dam. PCWA would have firm capacity, and SSWD would use shoulder capacity.

    - **Groundwater Module:** Roseville would increase use of groundwater to satisfy its needs in this alternative but would not have any additional surface water diversions.

    - **Elkhorn/Elverta Module:** Sacramento would use groundwater to meet projected unmet demand or would divert separately from the Sacramento River at the Elkhorn site, and construct its own treatment and transmission facilities to serve its needs.

FINDINGS

1. **Table D-1** summarizes the results of the Phase 1 environmental evaluation by identified facility modules, showing the potential levels of magnitude of effects by major resource category. Note that for the purposes of Phase 1 environmental evaluation, the groundwater module is excluded in the assessment because modeling work necessary for the evaluation will be completed in Phase 2 of the study.

2. **Table D-2** summarizes the Phase 1 environmental evaluation for identified preliminary action alternatives, showing the potential levels of magnitude of effects by major resource category. Note that for the purposes of Phase 1 environmental evaluation, the groundwater module is excluded in the assessment because most initially apparent impacts would be related to the diversion facilities and related infrastructure.

Table D-1. Summary of Phase 1 Environmental Evaluation for Facility Modules

Module[2]	Potential Level of Magnitude of Effect[1] by Resource Category				
	Botany	Wildlife	Fisheries/ Water Quality	Recreation	Land Use
Elkhorn/Elverta Module[3]	Medium	Medium	Medium	Low	Low
Sankey Module	Medium	Medium	Medium	Low	Low
Nicolaus Module	High/ Infeasible	High/ Infeasible	Medium	Medium	Low
ARPS Module	Medium/High[4]	Medium/High[4]	High	Medium	Low
Folsom Dam Module[5]	Low	Low	High	Low	Low

[1] Potential Level of Magnitude of Effect:
- High/Infeasible: Significant impacts would be infeasible to mitigate
- High: Mostly significant impacts in one or more resource areas, with significant need for mitigation
- Medium: Mostly significant impacts with some less than significant
- Low: Mostly less than significant impacts

[2]] For the purposes of the Phase 1 environmental evaluation, it should be noted that potential groundwater effects cannot be determined prior to modeling that will be conducted in Phase 2.

[3] For the purposes of Phase 1 environmental evaluation, the assessment is applicable to Elkhorn/Elverta Diversion Alternative as a whole and all Elkhorn/Elverta modules in other alternatives.

[4] Potential effects are mostly associated with pipeline alignment. Mitigation measures that may be included in other ongoing local development activities could potentially reduce the rating. Opportunities also exist for incorporating mitigation measures by moving the alignment within the corridor to reduce the level of potential effect. For the purposes of Phase 1 environmental evaluation, a more conservative rating is assessed.

[5] For the purposes of Phase 1 environmental evaluation, the assessment is applicable to both Folsom Dam modules in the ARPS Alternative and Folsom Dam Alternative.

Table D-2. Summary of Phase 1 Environmental Evaluation for Preliminary Action Alternatives

Alternative[2]	Potential Level of Magnitude of Effect[1] by Resource Area				
	Botany	Wildlife	Fisheries/ Water Quality	Recreation	Land Use
Elkhorn/Elverta Diversion Alternative	Low	Low	Medium	Low	Low
Sankey Diversion Alternative	High	High	Medium	Low	Low
Feather River Diversion Alternative	High/ Infeasible	High/ Infeasible	Medium	Medium	Low
ARPS Alternative	Medium/High[3]	Medium/High[3]	High	Medium	Low
Folsom Dam Alternative	Medium	Medium	High	Low	Low

[1] Potential Level of Magnitude of Effect:
- High/Infeasible: Significant impacts would be infeasible to mitigate
- High: Mostly significant impacts in one or more resource areas, with significant need for mitigation
- Medium: Mostly significant impacts with some less than significant
- Low: Mostly less than significant impacts

[2 Potential groundwater effects cannot be determined prior to modeling that will be conducted in Phase 2.

[3] Potential effects are mostly associated with pipeline alignment. Mitigation measures that may be included in other ongoing local development activities could potentially result in low ratings. Opportunities also exist for incorporating mitigation measures to reduce the level of potential effect by moving the pipeline alignment within the corridor to avoid sensitive habitat areas.

METHODOLOGY OF PHASE 1 ENVIRONMENTAL EVALUATION

Phase 1 environmental evaluation consisted of the following:

- A synthesis of anticipated potential impacts and mitigation measure feasibility for all components of a module based on evaluation of the anticipated level of magnitude of effects/mitigation feasibility for each component

- An evaluation of the level of potential and anticipated impacts for each alternative as composed of the various modules

For the purposes of Phase 1 environmental evaluation, the following resources areas were excluded in the evaluation:

- Water supply. The potential impacts to water supply, especially impacts on the Central Valley Project (CVP) and State Water Project (SWP), are not included because the necessary hydrologic modeling has not been completed. Supplemental groundwater use and its associated impacts are not evaluated for the same reason. However, clearly the Elkhorn/Elverta Alternative would have no groundwater effects because it is the only alternative that does not include a groundwater module.

- Cultural Resources. Cultural resource impacts have not been considered at this stage for two reasons: (1) a responsible study of these resources requires definition of a project footprint, which is still under study, and (2) based on early reconnaissance, it was determined that most of the potential cultural resources impacts that may be found in the study area would be mitigable and would not distinguish among alternatives at this stage. Criteria used for analysis are presented below by resource area.

CRITERIA FOR IDENTIFICATION OF POTENTIAL EFFECTS (IMPACTS)

Criteria for identification of potential effects are presented in this section for the following resource areas: botany, wildlife, fisheries, water quality, recreation, and land use. Evaluation was based on criteria used to evaluate projects under the California Environmental Quality Act/National Environmental Policy Act (CEQA/NEPA). These criteria are intended to qualitatively identify and compare potential impacts of the identified preliminary alternatives.

Temporary construction-related disruptions and impacts, which would clearly not be significant or could easily be mitigated, are not included because these impacts do not distinguish among alternatives. For example, transportation, air quality, and noise will be discussed at a later date. Agricultural impacts and water supply impacts also were not considered.

Botany

Different criteria are used for special-status species, wetland and riparian habitats, and vernal pools.

- **Special-Status Species:** Federally listed special-status species have the highest priority consideration because, if present, they trigger a Section 7 consultation with the United States Fish and Wildlife Service (USFWS). State-listed species by the California Fish and Game Commission (CFGC) also have a high priority, but the process of obtaining permits for impacting state-listed species is somewhat less rigorous. The California Native Plant Society (CNPS) maintains four lists of species it considers special status; Lists 1A and 1B have the highest priority. Although these species do not have statutory or regulatory protection, the California Department of Fish and Game (CDFG) may sometimes oppose unmitigated impacts to these species. However, CDFG has no direct regulatory authority to prevent such impacts. Aerial photos, site reconnaissance, and the California Natural Diversity Database (CNDDB) were used to determine whether habitat for special-status species occurs within the study area. In most cases, site surveys will be needed to make a final determination regarding the presence or absence of species in specific areas. **Table D-3** identifies special-status species that exist in the overall SRWRS study area. Site-specific surveys will be conducted at a later phase of the SRWRS to delineate actual locations of species.

Table D-3. Preliminary List of Special-Status Species in the SRWRS Study Area

Common Name	Scientific Name	Status		Listing Agency or Commission	Habitat
		State	Federal		
Botanical					
Henderson's bent grass	*Agrostis hendersonii*		SoC	None (CNPS List 3)	Valley and foothill grassland
San Joaquin spearscale	*Atriplex joaquiniana*		SoC	None (CNPS List 1B)	Chenopod scrub, meadows and seeps, playas, valley and foothill grassland/alkaline
Big-scale balsamroot	*Balsamorhiza macrolepis* var. *macrolepis*		SoC	None (CNPS List 1B)	Chaparral, cismontane woodland, valley and foothill grassland
Stebbins's morning-glory	*Calystegia stebbinsii*	E	E	CFGC, USFWS	Chaparral, cismontane woodland/gabbroic
Pine Hill ceanothus	*Ceanothus roderickii*	R	E	CFGC, USFWS	Chaparral, cismontane woodland/serpentinite or gabbroic
Red Hills soaproot	*Chlorogalum grandiflorum*		SoC	None (CNPS List 1B)	Chaparral, cismontane woodland, lower montane coniferous forest
Brandegee's clarkia	*Clarkia biloba* ssp. *brandegeae*		SoC	None (CNPS List 1B)	Chaparral, cismontane woodland
Hispid bird's-beak	*Cordylanthus mollis* ssp. *hispidus*		SoC	None (CNPS List 1B)	Meadows and seeps, playas, valley and foothill grassland
dwarf downingia	*Downingia pusilla*			None (CNPS List 2)	Valley and foothill grassland, vernal pools
Pine Hill flannelbush	*Fremontodendron decumbens*	R	E	CFGC, USFWS	Chaparral, cismontane woodland/ serpentinite or gabbroic, rocky
Butte County fritillary	*Fritillaria eastwoodiae*		SoC	None (CNPS List 3)	Chaparral, cismontane woodland, lower montane coniferous forest
El Dorado bedstraw	*Galium californicum* ssp. *sierrae*	R	E	CFGC, USFWS	Chaparral, cismontane woodland, lower montane coniferous forest
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	E	SoC	CFGC	Marshes and swamps (lake margins), vernal pools

Table D-3. Preliminary List of Special-Status Species in the SRWRS Study Area (cont'd)

Common Name	Scientific Name	Status		Listing Agency or Commission	Habitat
		State	Federal		
Botanical (cont'd)					
Bisbee Peak rush-rose	*Helianthemum suffrutescens*		SoC	None (CNPS List 3)	Chaparral (often serpentinite, gabbroic, or Ione soil)
Ahart's dwarf rush	*Juncus leiospermus* var. *ahartii*		SoC	None (CNPS List 1B)	Valley and foothill grassland
Red Bluff dwarf rush	*Juncus leiospermus* var. *leiospermus*		SoC	None (CNPS List 1B)	Chapparal, cismontane woodland, meadows and seeps, valley and foothill grasslands, vernal pools/vernally mesic
Dubious pea	*Lathyrus sulphureus* var. *argillaceus*			None (CNPS List 3)	Cismontane woodland, lower montane coniferous forest, upper montane coniferous forest
Legenere	*Legenere limosa*		SoC	None (CNPS List 1B)	Vernal pools
Pincushion navarettia	*Navarettia myersii* ssp. *myersii*		SoC	None (CNPS List 1B)	Vernal pools
Sacramento Orcutt grass	*Orcuttia viscida*	E	E	CFGC, USFWS	Vernal pools
Sanford's arrowhead	*Sagittaria sanfordii*		SoC	None (CNPS List 1B)	Marshes and swamps (assorted shallow freshwater)
Layne's ragwort	*Senecio layneae*	R	T	CFGC, USFWS	Chaparral, cismontane woodland/serpentinite or gabbroic, rocky
El Dorado mule-ears	*Wyethia reticulata*		SoC	None (CNPS List 1B)	Chaparral, cismontane woodland, lower montane coniferous forest

Table D-3. Preliminary List of Special-Status Species in the SRWRS Study Area (cont'd)

Common Name	Scientific Name	Status		Listing Agency or Commission	Habitat
		State	Federal		
Fisheries					
Winter-run chinook salmon	*Oncorhynchus tshawytscha*	E	E	NOAA Fisheries	River
Spring-run chinook salmon	*Oncorhynchus tshawytscha*	T	T	NOAA Fisheries	River
Fall-run chinook salmon	*Oncorhynchus tshawytscha*		C	NOAA Fisheries	River
Late-fall-run chinook salmon	*Oncorhynchus tshawytscha*		C	NOAA Fisheries	River
Steelhead	*Oncorhynchus mykiss*		T	NOAA Fisheries	River
Green sturgeon	*Acipenser medirostris*	SSC	C	NOAA Fisheries	River
Delta smelt	*Hypomesus transpacificus*	T	T	USFWS	River/estuary
Sacramento splittail	*Pogonichthys macrolepidotus*	SSC	SoC	USFWS	River/estuary
Longfin smelt	*Spirinchus thaleichthys*	SSC		CFGC	Estuary
River lamprey	*Lampetra ayresi*	SSC		CFGC	River/estuary
Wildlife					
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphut*		T	USFWS	Elderberry shrubs
Vernal pool fairy shrimp	*Branchinecta lynchi*		T	USFWS	Vernal pool
Vernal pool tadpole shrimp	*Lepidurus packardi*		T	USFWS	Vernalool
Western pond turtle	*Clemmys marmorata*	SSC		CFGC	Canals, ponds, rivers
Giant garter snake	*Thamnophis gigas*		T	USFWS	Canals, rice fields, marshes
California tiger salamander	*Ambystoma californiense*		C	USFWS	Vernal pool, grasslands, uplands
Bank swallow	*Riparia riparia*	T		CFGC	River banks
Tri-colored blackbird	*Agelaius tricolor*	SSC		CFGC	Marshes, wetlands, ponds
California yellow-billed cuckoo	*Coccyzus americanus occidentalis*	E		CFGC	Dense riparian woodlands, scrub
Burrowing owl	*Athene cunicularia*	SSC		CFGC	Grasslands, agricultural fields
Swainson's hawk	*Buteo swainsoni*	T		CFGC	Rivers, riparian, grasslands, agricultural fields
Northern harrier hawk	*Circus cyaneus*	SSC		CFGC	Fields, marshes
Cooper's hawk	*Accipiter cooperi*	SSC		CFGC	Woodlands, scrub

State and Federal Status Key

E – Endangered T – Threatened C - Candidate SoC - Species of Concern SS - Species of Special Concern

Listing Agency Key

CFGC – California Fish and Game Commission
CNPS List 1B - Rare, threatened, or endangered in California and elsewhere.
CNPS List 2 - Rare, threatened, or endangered in California, but more common elsewhere.
CNPS List 3 - More information needed (plant is on CNPS Review List)
NOAA – National Oceanic and Atmospheric Administration
USFWS – United States Fish and Wildlife Service

- **Wetland and Riparian Habitats:** Wetlands are regulated by the United States Army Corps of Engineers (USACE). All state and federal regulatory agencies have a no-net-loss policy, thus, all impacts to wetlands must be fully mitigated at a minimum ratio of 1:1. USACE and other agencies often require or recommend higher ratios, sometimes as high as 3:1, especially for particularly valuable wetlands such as vernal pools. Permits to impact large wetland areas may take several years to obtain, and the applicant would need to prepare substantial mitigation and monitoring plans for wetland impacts. Areas of riparian habitat are usually within the jurisdiction of the CDFG, in that they are within the bed or banks of streams and thus are subject to the requirement for streambed alteration agreements. The loss of riparian habitat constitutes loss of feeding and breeding habitat for wildlife, often special-status species. The same sources as for special-status species were used to determine the potential occurrence of riparian habitat and wetlands.

- **Vernal Pools:** Vernal pools are isolated, depressional wetlands that generally hold water in the winter and spring and are dry in summer and fall. Vernal pools provide exclusive or partial habitat for a number of species that are adapted to these unique environmental conditions. Many of these species are rare or listed plant or wildlife species. Special-status plant species that may occur in vernal pools in the project area include dwarf downingia, Boggs Lake hedge-hyssop, legenere, Sacramento Orcutt grass, Red Bluff dwarf rush, and pincushion navarettia. Special-status wildlife species in the project area that use vernal pool habitat include fairy shrimp, tadpole shrimp, and California tiger salamander. Vernal pools occur throughout the study area, and may be crossed by several proposed pipeline routes.

Wildlife

Species listed as endangered or threatened pursuant to the California state and federal Endangered Species Acts (ESAs) present the most critical constraint to project development. The CNDDB and Wildlife Habitats Relationships program, electronic databases of the known distributions and occurrences of wildlife species of special concern and their habitats, and databases developed for the Placer Legacy Habitat Conservation Plan (HCP) and the Natomas HCP were reviewed to identify special-status species. **Table D-3** identifies special-status species that occur in the SRWRS study area based on these databases. Actual presence and locations of wildlife species will be determined after consultation with the resource agencies and site-specific surveys. In addition to the presence of special-status species, or designated habitat for such species at a location related to an alternative infrastructure component, the extent of potential habitat loss for an important wildlife community is also an important project constraint. Habitat loss and fragmentation often cause species to become listed as threatened or endangered. Thus, a number of wildlife species are not listed as threatened or endangered, but their populations are declining. For such species, further habitat loss and fragmentation may contribute to continued declines. These species may be recognized by a state or federal resource agency, land management agency, or conservation organization as requiring protection to avoid potential future listing as threatened or endangered.

Conversion of a natural biotic system to a new system resulting from a manmade structure generally results in a significant biological impact. Damming a creek, for example, to create water storage destroys existing wildlife habitat and values. Loss and/or fragmentation of habitat not only destroys habitat but results in loss of animals dependent on the habitat.

In some cases, project development can present opportunities for mitigation that may surpass the impact of the project. For example, treated water pipelines offer potential for habitat establishment and/or enhancement through treatment of finished grade and surface. These opportunities have been noted.

Fisheries Resources

Anadromous and resident fisheries resources within the SRWRS study area can be classified into three categories: listed and special status-species, native species, and game species. Each category has separate management considerations. Fish species of primary management concern will be evaluated in greater detail in Phase 2 of the SRWRS.

- **Listed and Other Special-Status Species:** Under the federal and state ESAs, listed and candidate species and designated critical habitat receive the greatest amount of protection under the law and require the most rigorous level of ESA compliance.

  USFWS maintains a list of fish species of concern, an informal term used by some, but not all, USFWS offices. USFWS species of concern are defined as "sensitive species that have not been listed, proposed for listing, nor placed in candidate status."[3] USFWS species of concern receive no legal protection and use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species.[4]

  CDFG also maintains a list of fish species of special concern.[5] Although species of concern do not have statutory or regulatory protection, this designation is intended to result in special consideration for these animals, and resource agencies (i.e., USFWS and CDFG) would likely oppose unmitigated actions that could significantly impact these species.

  Table D-3 identifies the special-status species that exist in the SRWRS study area. Site-specific surveys will be conducted in a later phase to delineate actual locations of species.

- **Native Species:** Populations of California's native fish fauna have been greatly reduced due to habitat alteration and other disturbances, including dams, water diversions, land use practices, and pollution. Because of this, CDFG and other resource agencies have taken an interest in protecting native fish species and their habitats. Therefore, CDFG would likely oppose unmitigated impacts to these species and to any relatively undisturbed aquatic habitats.

- **Game Species:** Game species, including native trout and many exotic species (e.g., black bass), are under CDFG's jurisdiction. These species often constitute a major recreational and economic resource for the state, and CDFG would oppose unmitigated impacts to this resource.

Aquatic communities and associated fish species located in the riverine and lacustrine environments within the study area are specifically related to five potentially affected geographic areas, including (1) the Sacramento River; (2) the lower Feather River; (3) the lower American River; (4) the upper American River; and (5) the Sacramento-San Joaquin River Delta (Delta). Fish species of "primary management concern" and aquatic and riparian habitat used by these species are described below.

- **Fish Species of Primary Management Concern.** Fisheries resources of primary management concern are those having special state and federal status, and those species of recreational or commercial importance, including the following:

[3] USFWS. 2003. Species of Concern. http://sacramento.fws.gov/es/spp_lists/animal_sp_concern.cfm (last accessed on October 24, 2003).
[4] Ibid.
[5] Moyle, P.B., Yoshimaya, R.M., Williams, J.E., Wikramanayake, E.D. 1995. Fish Species of Special Concern of California, 2nd edition. Sacramento, CDFG.

  - Federally listed and state-listed species occurring within the region include winter-run chinook salmon (Oncorhynchus tshawytscha), spring-run chinook salmon (Oncorhynchus tshawytscha), Steelhead (Oncorhynchus mykiss), Delta smelt (Hypomesus transpacificus), and North American green sturgeon (Acipenser medirostris).

  - Recreationally or commercially important species occurring within the region include fall-run and late-fall-run chinook salmon (Oncorhynchus tshawytscha),[6] American shad (Alosa sapidissima), striped bass (Morone saxatilis), and various reservoir fish species.

- **Riparian Habitat.** In addition to instream aquatic habitat, shaded riverine aquatic (SRA) habitat is an important component of fish habitat. SRA habitat consists of vegetation located in the nearshore aquatic zone occurring at the interface between the river and adjacent woody riparian habitat. Principal attributes of SRA habitat include (1) an adjacent bank composed of natural, eroding substrates supporting riparian vegetation that overhangs and/or protrudes into the water; (2) woody debris in the water, such as leaves, logs, branches, and roots; and (3) variable water depths, velocities, and currents.[7] These attributes provide high-value feeding, escape, and spawning areas for regionally important fish and wildlife species.[8]

Criteria used to evaluate each alternative with respect to fisheries resources include the following:

- Potential for adverse impacts to fisheries resources due to changes in aquatic habitat availability associated with species-specific life stages present in the system

- Potential for adverse impacts to fisheries resources due to changes in flow of sufficient magnitude and frequency to impair the long-term reproductive success of fish species that are either federally-listed or state-listed, recreationally important, or commercially important

- Potential for adverse impacts to fisheries resources due to changes in water temperatures of sufficient magnitude and frequency to impair the long-term reproductive success of fish species that are either federally-listed or state-listed, recreationally important, or commercially important

- Potential for conditions that could influence the ability of an existing population of a listed or recreationally or commercially important fish to successfully reproduce

Water Quality

The SRWRS project alternatives include locations along the Sacramento, Feather, and American rivers, and at Folsom Dam. The Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) manage these rivers and various reservoirs of the CVP and SWP to provide water supplies throughout the state. Increased diversions from one of the project alternative locations being evaluated in this study may influence Reclamation's and DWR's integrated operation of the CVP/SWP facilities as they manage the system to meet water supply and environmental regulatory requirements. Thus, the criteria used to evaluate each alternative for water quality impacts include the following:

- Potential for water quality conditions that would fail to achieve project goals and objectives

[6]Fall-run chinook salmon is also a candidate for federal and state listing.
[7]USFWS. 1993. A community-based habitat suitability index model for shaded riverine aquatic cover, selected reaches of the Sacramento River system. Sacramento, CA.
[8]Surface Water Resources, Inc. 2001. Draft Lower American River Baseline Report. Prepared for Lower American River Fisheries and Instream Habitat (FISH) Working Group. March.

- Potential for water quality conditions that would result in conditions that would be likely to violate county, state, or federal water quality goals, objectives, and policies
- Potential for water quality conditions that would be likely to violate existing federal and state water quality standards and beneficial use designations

Recreation

Recreation resources were assessed according to whether an alternative would result in any of the following:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of a facility would occur or be accelerated
- Include recreation facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment
- Substantially conflict with established or planned recreation uses
- Conflict with state parks, or any agency management objectives
- Displace certain user groups (e.g., boaters)
- Permanently eliminate a recreation opportunity, activity, or existing facility

Land Use

Criteria for determining whether affected land uses represent a constraint are based partly on CEQA guidelines[9] stating that a project should be analyzed as to whether it results in any of the following:

- Physical division of an established community
- Conflict with applicable land use plans or policies
- Conflict with applicable HCPs

EVALUATION ASSUMPTIONS AND LIMITATIONS

Environmental evaluations require very specific project configuration and operation and maintenance descriptions. Although some aspects of the alternatives have been determined, much of the detailed project description information is under development. This environmental review is limited by the present level of conceptual design of each alternative (for example, operations are not yet defined), and the reconnaissance level of the environmental analysis. Necessary modeling for certain resource areas and agency consultation has not yet been conducted. Similarly, considerations of cumulative impacts are not included. As noted above, all evaluations of potential effects (impacts) and their potential magnitude (significance) will require further study and detailed definition in Phase 2.

[9] CELSOC. 2003. California Environmental Quality Act CEQA Guidelines.

RESULTS OF PHASE 1 ENVIRONMENTAL EVALUATION

Phase 1 environmental evaluation for identified preliminary alternatives is detailed in **Attachment A**. Anticipated preliminary impacts for each component of the alternatives are based on a reconnaissance level of analysis by resource area. The Phase 1 environmental evaluation is discussed in three parts:

- Evaluation for facility modules
- Evaluation for preliminary action alternatives
- Recommendations

EVALUATION FOR FACILITY MODULES

As previously mentioned, an alternative could have one or more facility modules. Before assessments can be made of identified preliminary action alternatives, assessments for each facility module are necessary and results are more geographically focused.

Elkhorn/Elverta Module

For the purposes of Phase 1 environmental evaluation, the assessment is applicable to the Elkhorn/Elverta Diversion Alternative as a whole and all Elkhorn/Elverta modules in other alternatives.

- **Botany:** Species of concern that would occur in the riparian woodland at the site include Sanford's arrowhead. Although no special-status species are known to occur within the 400-foot treated water pipeline corridor based on existing databases, Sacramento Orcutt grass and pincushion navarettia occur in the area; a definitive determination of their presence can only be made after surveys are conducted.

- **Wildlife:** This area is designated as a Swainson's Hawk Zone in the Natomas HCP. Loss of riparian woodland at the diversion location would likely reduce habitat for Swainson's hawk nesting, and habitat for the federally threatened giant garter snake. Fragmentation and loss of wildlife community associated with this habitat would be difficult to mitigate on site. The treated water corridor traverses wetland habitat in at least one segment, which may have low to moderate densities of vernal pools that support the federally threatened fairy shrimp and California tiger salamander. These impacts could be reduced by placing the pipeline north of Baseline Road and/or pipeline surfaces could be treated to develop wetland and vernal pool habitat for any remaining impacts. The Placer County General Plan proposes to expand Baseline Road. Much construction will occur as part of the proposed Placer Vineyards Specific Plan. The vernal pools south of Baseline Road within Placer County and west of Walerga Road will either be filled or protected as part of the Placer Vineyards project. Potential impacts to Jacobs Slough may be eliminated by moving or modifying the WTP site. Reduction of bird attraction, a concern of the Federal Aviation Administration (FAA), may also be accomplished by modifying the site. Further consultation with Sacramento County will resolve these issues.

- **Fisheries:** Long-term operational impacts are unknown at this time and will require additional analysis. One of the treated water pipelines appears to run parallel to approximately 2 miles of the Natomas East Main Drainage Canal (NEMDC). More engineering design details are required to determine whether this pipeline alignment could result in significant impacts to riparian and SRA habitat and/or fisheries resources in the NEMDC. Because this reach of the Sacramento River is primarily used by anadromous fish as a migration corridor, the location of this alternative likely would result in a reduced amount of potential impacts to riverine fisheries resources relative to other

alternatives. Most of the anadromous fish spawning and rearing habitat is located upstream and would not likely be affected by diverting at this site.

- **Water Quality:** Long-term operational impacts are unknown at this time; therefore, additional analysis is required. Potential impacts could include reduced downstream dilution potential for pollutants and surface water quality parameters of concern. Because water quality in the Sacramento River is generally considered to be of lesser quality than water from the lower American River, potential water quality impacts from this alternative could be of smaller consequence relative to other alternatives under consideration.

- **Recreation:** Protrusion of the diversion structure would result in reduction in the quality of the recreational experience, which may be a significant impact.

- **Land Use:** The diversion facilities will not conflict with existing or planned uses in the area. Coordination with current plans to expand the Sacramento International Airport should resolve any potential conflicts with location of the WTP.

Sankey Module

The evaluation includes the diversion on the Sacramento River near Sankey Road and its associated WTP and transmission pipelines serving PCWA, SSWD, and Roseville.

- **Botany:** The habitat at the diversion site is riparian woodland that is more disturbed than at the Elkhorn/Elverta Diversion location. Special-status species potentially occurring here include Sanford's arrowhead. Wetlands and vernal pool habitat may be present west of the WTP location. Potential impacts could be avoided by adjusting the boundaries of the proposed WTP site. The treated water pipeline alignment would be adjacent to a population of dwarf downingia — a special-status vernal pool species. Other special-status species occurring in the area crossed by the pipeline are Boggs Lake hedge-hyssop, big-scale balsamroot, hispid bird's-beak, and legenere — all of which occur in vernal pool habitats and grasslands. These are considered potential significant impacts.

- **Wildlife:** Terrestrial biology impacts at this diversion location would be less extensive than at the Elkhorn/Elverta Diversion location. However, there is greater potential for presence of the federally threatened giant garter snake and similar potential for Swainson's hawk. Habitat fragmentation may be an issue as cliff swallow nests are abundant on the bridges crossing Sankey Road and across the Natomas Canal. The habitats crossed by the treated water pipeline corridor may support the giant garter snake. Canals may support western pond turtles, and burrowing owls may also be present. However, development of the linear pipeline corridor offers the potential for establishing new habitat and/or enhancing habitat through treatment of finished grade and surface.

- **Fisheries:** Long-term operational impacts are unknown at this time and will require additional analysis. Because this reach of the Sacramento River is primarily used by anadromous fish as a migration corridor, the location of this alternative in the watershed likely would result in a reduced amount of potential impacts to riverine fisheries resources relative to other alternatives. Most of the anadromous fish spawning and rearing habitat is located upstream and would not likely be affected by diverting at this site.

- **Water Quality:** Long-term operational impacts are unknown at this time; therefore, additional analysis is required. Potential impacts could include reduced downstream dilution potential for pollutants and surface water quality parameters of concern. Because water quality in the Sacramento River is generally considered to be of lesser quality than water from the lower American River,

potential water quality impacts from this alternative could be of smaller consequence relative to other alternatives under consideration (e.g., those involving diversions from the American River).

- **Recreation:** Although there are recreation facilities north of the diversion location, the diversion is far enough away to avoid significant impacts to these facilities. Protrusion of the diversion structure would result in reduction in the quality of the recreational experience, which may be a significant impact.

- **Land Use:** Potential conflict of the WTP with nearby residential uses should be studied and early consultation initiated.

Nicolaus Module

The evaluation includes the diversion on the Feather River near Nicolaus and its associated WTP and transmission pipelines serving PCWA, SSWD, and Roseville.

- **Botany:** Numerous special-status species have the potential to occur in this area, which contains extensive good-quality riparian wetland. Dwarf downingia, which occurs in valley and foothill grassland and vernal pools, is known to occur in the area. Required mitigation would be extensive and it is unlikely that it would be feasible. Vernal pools and dwarf downingia also occur within the treated water corridor along the northern edge of Nicolaus Road and along the north-south alignment adjacent to Fiddyment Road.

- **Wildlife:** The proximity of this site to the Feather River Wildlife Area, which is known to support significant sensitive biological resources, has the potential for greater levels of significant terrestrial biological resource impacts than any of the other alternatives. Effects can be anticipated to the following special-status species: Swainson's hawk, giant garter snake, valley elderberry longhorn beetle, bank swallows, and western pond turtle. Mitigation would be infeasible.

- **Fisheries:** Long-term operational impacts are unknown at this time and will require additional analysis. Higher quality SRA habitat at this location may require extensive mitigation relative to other alternatives under consideration.

- **Recreation:** The Bobelaine Ecological Reserve is located within 1 mile upstream of the diversion and offers 5 miles of trails that run through oak grassland, open grassland, sloughs, a lake, and riparian woodland. Any potential effect on the reserve, which is connected to the nearby Feather River Wildlife Area, would be considered a significant adverse impact.

- **Land Use:** No significant land use impacts are anticipated.

ARPS Module

The evaluation includes the expanded diversion on the American River and its associated WTP expansion and transmission pipelines serving PCWA.

- **Botany:** The treated water pipeline alignment would be adjacent to a known population of Brandegee's clarkia — a chaparral, cismontane woodland species. Other special-status species include dwarf downingia, Boggs Lake hedge-hyssop, big-scale balsamroot, hispid bird's beak, legenere, and dubious pea. These species occur in a variety of habitats—vernal pools, grasslands, wetland, chaparral, and woodlands. Because some of the area is within recently approved projects or projects under consideration, mitigation measures already may have been considered and

incorporated in project approvals. Consideration should also be given to shifting the alignment of the pipeline north to the extent possible to avoid vernal pools and other habitats of special-status species.

- **Wildlife:** Less than significant impacts are anticipated at the diversion location. The treated pipeline corridor between the Phase 2 WTP and the Sunset WTP may affect habitats for valley elderberry longhorn beetle, western pond turtle, and burrowing owl. The corridor between the Sunset WTP and west of Highway 65 would traverse areas mapped by the Placer Legacy HCP as moderate and high-density vernal pool habitat. These areas may support federally threatened species of vernal pool fairy shrimp, California tiger salamander, giant garter snake, and burrowing owl. These species occur in a variety of habitats—vernal pools, grasslands, wetland, chaparral, and woodlands. Because some of the area is within recently approved projects or projects under consideration, mitigation measures already may have been considered and incorporated in project approvals. As noted above, shifting the alignment within the corridor may also help reduce the level of magnitude of impacts. This pipeline corridor will require careful study to identify a biologically less sensitive corridor. Remaining potential impacts may be mitigated to some degree by treatment of finished grade and surface of the pipeline to reestablish habitat for special-status species and vernal pools.

- **Fisheries:** Long-term operational impacts are unknown at this time and will require additional analysis. This alternative's location in the watershed likely would result in greater potential impacts to riverine fisheries resources relative to alternatives along the Sacramento River and the Feather River because the entire 23-mile length of the lower American River is used by anadromous fish for migration, spawning, and rearing.

- **Water Quality:** Long-term operational impacts are unknown at this time; therefore, additional analysis is required. Potential impacts could include reduced downstream dilution potential for pollutants and surface water quality parameters of concern.

- **Recreation:** The site is within the Auburn State Recreation area. Current recreational uses in the vicinity include hiking, horseback riding, mountain biking, fishing, swimming, rafting, and kayaking. Approval for construction of the American River permanent pump station already has been issued and mitigation measures recommended in the EIS/EIR for the project have been incorporated. The footprint of the project would not change at the intake location. However, some potentially less than significant changes may occur in water levels in extremely dry years as a result of the project; this potential effect will be studied when modeling is conducted in Phase 2.

- **Land Use:** The WTP location may conflict with nearby residential uses and any needed mitigation measures should be incorporated in the planning stage.

Folsom Dam Module

The evaluation includes the expanded or new diversion on the American River at Folsom Dam and its associated WTP expansion (SJWD's Peterson WTP) and transmission pipelines serving PCWA and SSWD.

- **Botany/Wildlife:** No major botany or wildlife impacts are anticipated as a result of this module because there will be no change in the diversion footprint, and much of the new pipeline alignment goes through already urbanized areas or areas for which there are pending approvals for new development.

- **Fisheries:** Long-term operational impacts are unknown at this time and will require additional analysis. This alternative's location in the watershed likely would result in greater potential impacts to riverine fisheries resources relative to alternatives along the Sacramento River and the Feather

River because the entire 23-mile length of the lower American River is used by anadromous fish for migration, spawning, and rearing.

- **Recreation:** Folsom Dam Lake (also referred to as Folsom Reservoir) is entirely within the Folsom Dam Lake State Recreation Area. Some less than significant effects on water levels may occur in extremely dry years as a result of the project. This potential effect will be studied once modeling is conducted in Phase 2.

- **Land Use:** Some of the new pipelines traverse established residential areas that may be subjected to significant disruption during construction. Although in general, construction impacts were not considered in this evaluation, such impacts in established neighborhoods, especially if the construction period is prolonged, can be considered significant.

EVALUATION OF PRELIMINARY ALTERNATIVES

Phase 1 environmental evaluation for identified preliminary action alternatives is detailed in **Attachment A**.

RECOMMENDATIONS

1. The Feather River Diversion Alternative should be eliminated from further consideration because of the infeasibility of mitigating for anticipated disruption to the nearby presence of a riparian ecological community.

2. Opportunities for avoiding potential impacts from the Elkhorn/Elverta Diversion Alternative include the following:

    - Consideration should be given to locating the treated water pipeline segment at Baseline Road and Fiddyment Road on the north side of Baseline Road to reduce potential impacts to vernal pools. There is the potential for coordinating with Placer County to lay water pipeline while improvements are being made in connection with planned development in Placer County.

    - Consideration should be given to moving the WTP away from Jacobs Slough to minimize potential impacts to the slough ecosystem.

    - The engineering/environmental team should coordinate closely with Sacramento County to ensure that Sacramento International Airport and SRWRS planning is compatible.

3. Opportunities for avoiding potential impacts from the Sankey Diversion Alternative include the following:

    - Consideration should be given to modifying the siting of the Sankey Road WTP if it is verified that it impinges on nearby wetlands and vernal pools.

    - Potential conflict of the WTP with nearby residential uses should be evaluated. Early consultation with nearby residents would be warranted and any needed mitigation measures should be incorporated in the planning stage.

    - Selection of the specific alignment for the treated water pipelines serving the Sankey Diversion Alternative should be reviewed to avoid riparian/wetland and vernal pool habitats.

4. Opportunities for avoiding potential impacts from the ARPS Alternative include the following:

- The new pipeline alignment should be reviewed and modified in view of present botanical and wildlife resources, specifically high and moderately dense potential occurrence of vernal pools along Athens Road east and west of Highway 65. Moving the alignment outside this corridor would reduce, although not totally eliminate, anticipated impacts to vernal pools and associated special-status species in the area.

5. Opportunities for avoiding potential impacts from the Folsom Dam Alternative include the following:

    - The treated pipeline alignment connected with the Folsom Dam Alternative should be reviewed to ensure that it would minimize effects on wetlands, vernal pools, stream crossings, and drainage crossings.

6. Opportunities for incorporating mitigation measures in alternatives include the following:

    - Linear corridors for new pipeline alignments offer potential for habitat establishment and/or enhancement through treatment of finished grades and surfaces. If the alignment cannot be moved to avoid impacts to wetlands and vernal pools, and the impacts are determined to be significant, this technique would be a potential measure for on-site mitigation.

    - In areas where there may be potential conflicts with either existing uses or planning in progress (for example, Sacramento International Airport's current planning for expansion or potential conflicts with nearby residents in the vicinity of the Sankey Road WTP), a focused consultation program should be undertaken to identify whether there would be any potential impacts, and if so, to obtain agreement on mitigation measures that could be incorporated in the alternatives.

Figure D-1. Comparison of Known Biologically Sensitive Areas and Elkhorn/Elverta Diversion Alternative

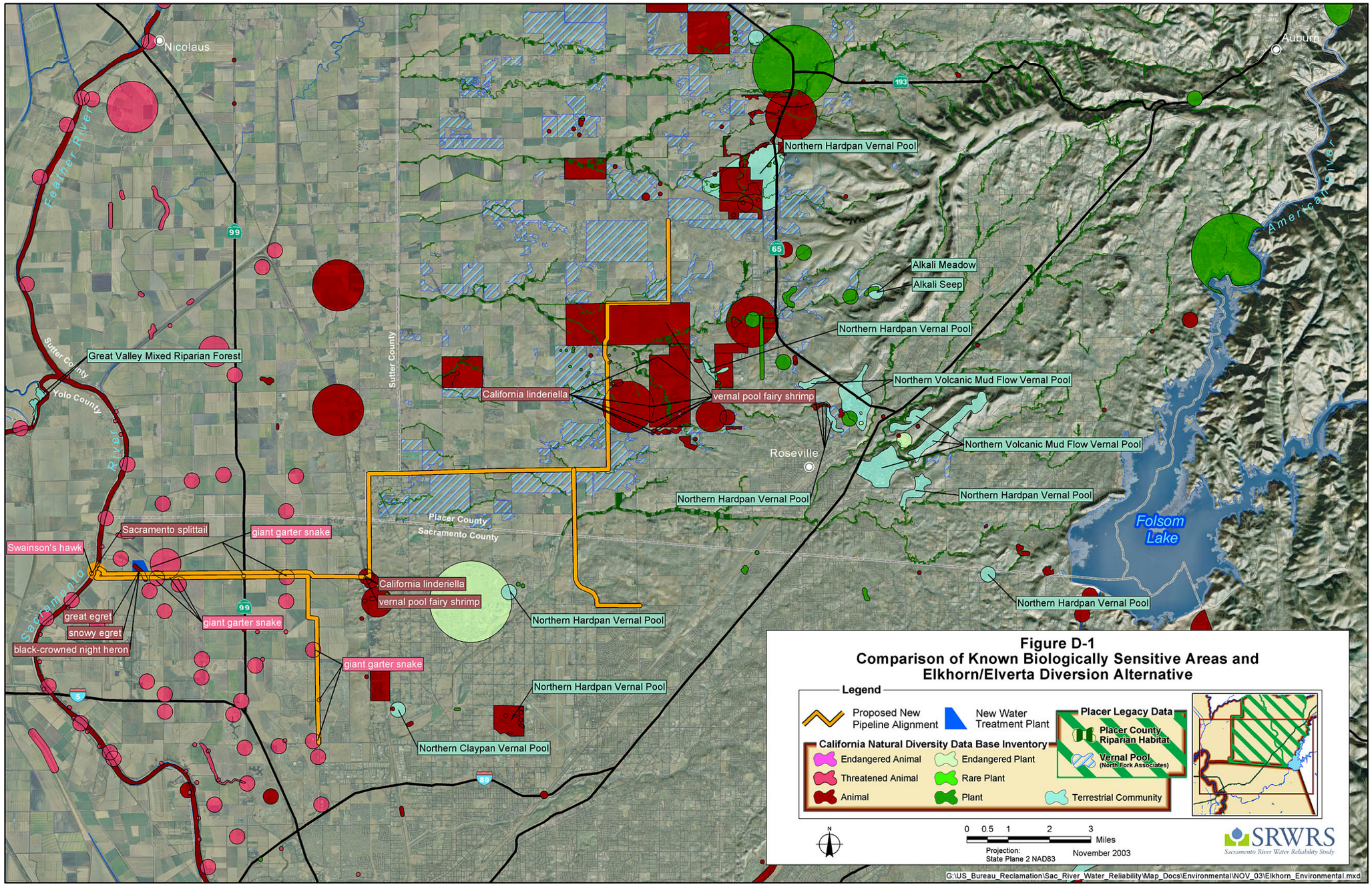


Figure D-2. Comparison of Known Biologically Sensitive Areas and Sankey Diversion Alternative

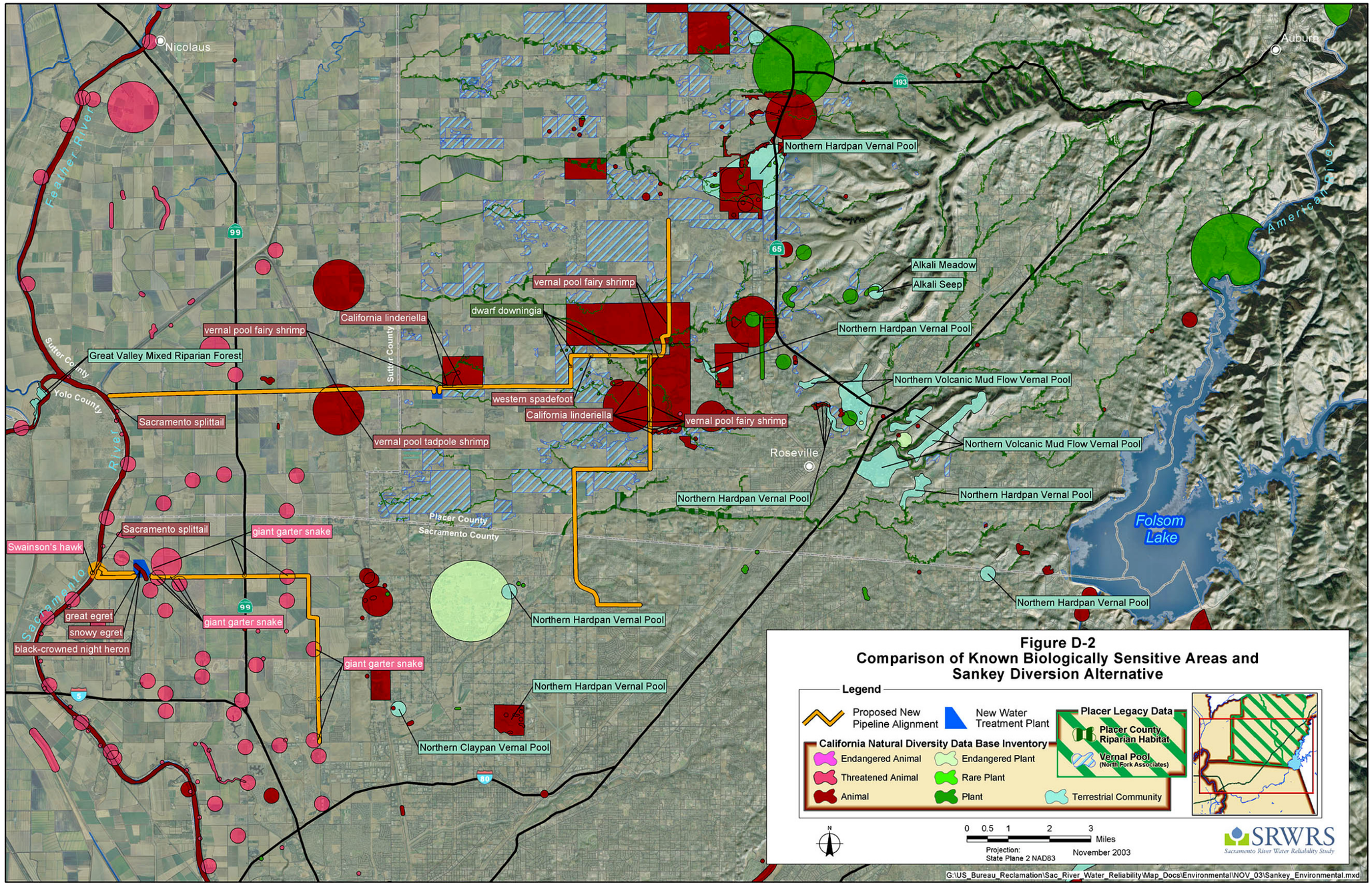


Figure D-3. Comparison of Known Biologically Sensitive Areas and Feather River Diversion Alternative

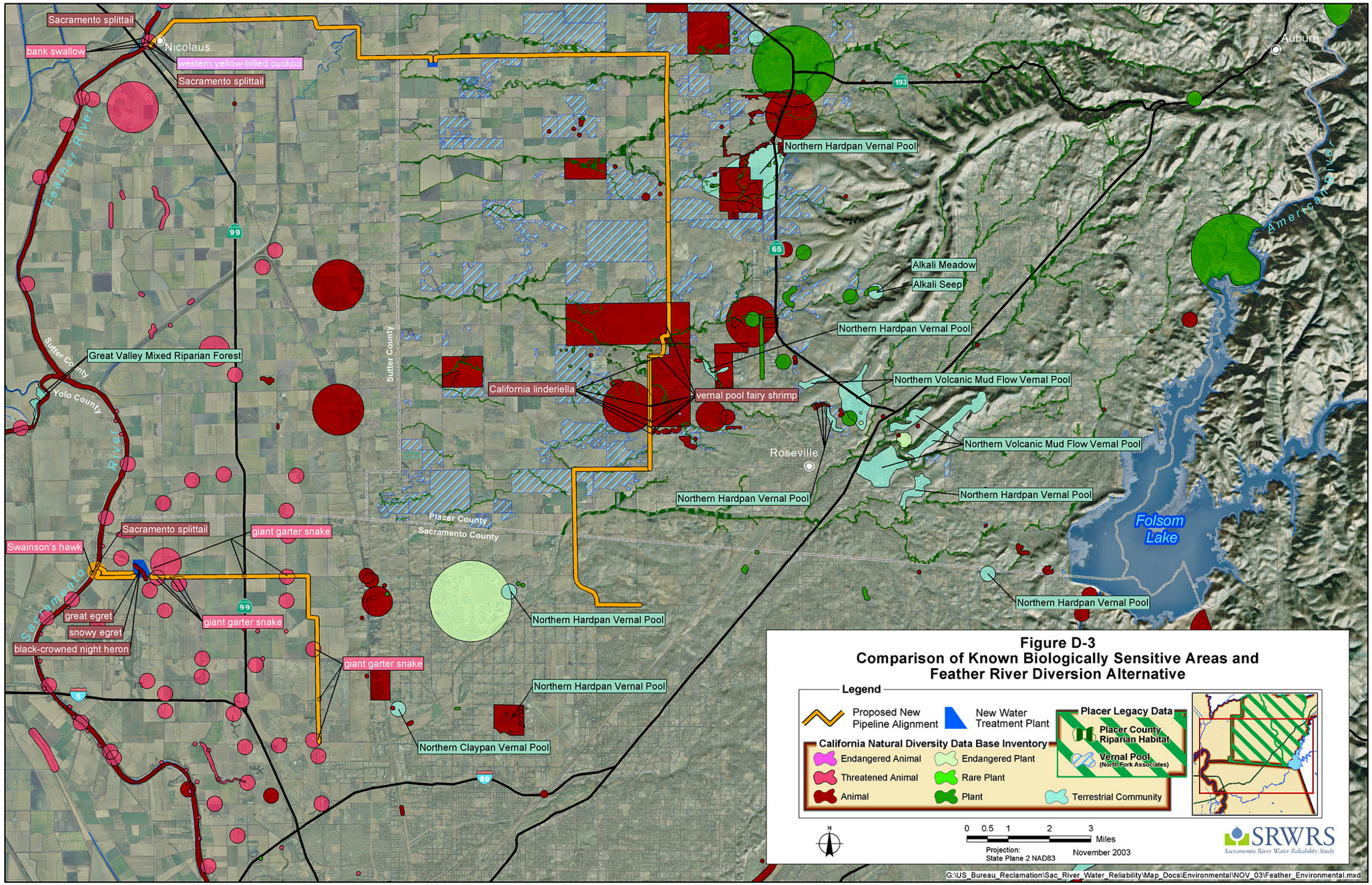


Figure D-4. Comparison of Known Biologically Sensitive Areas and ARPS Alternative

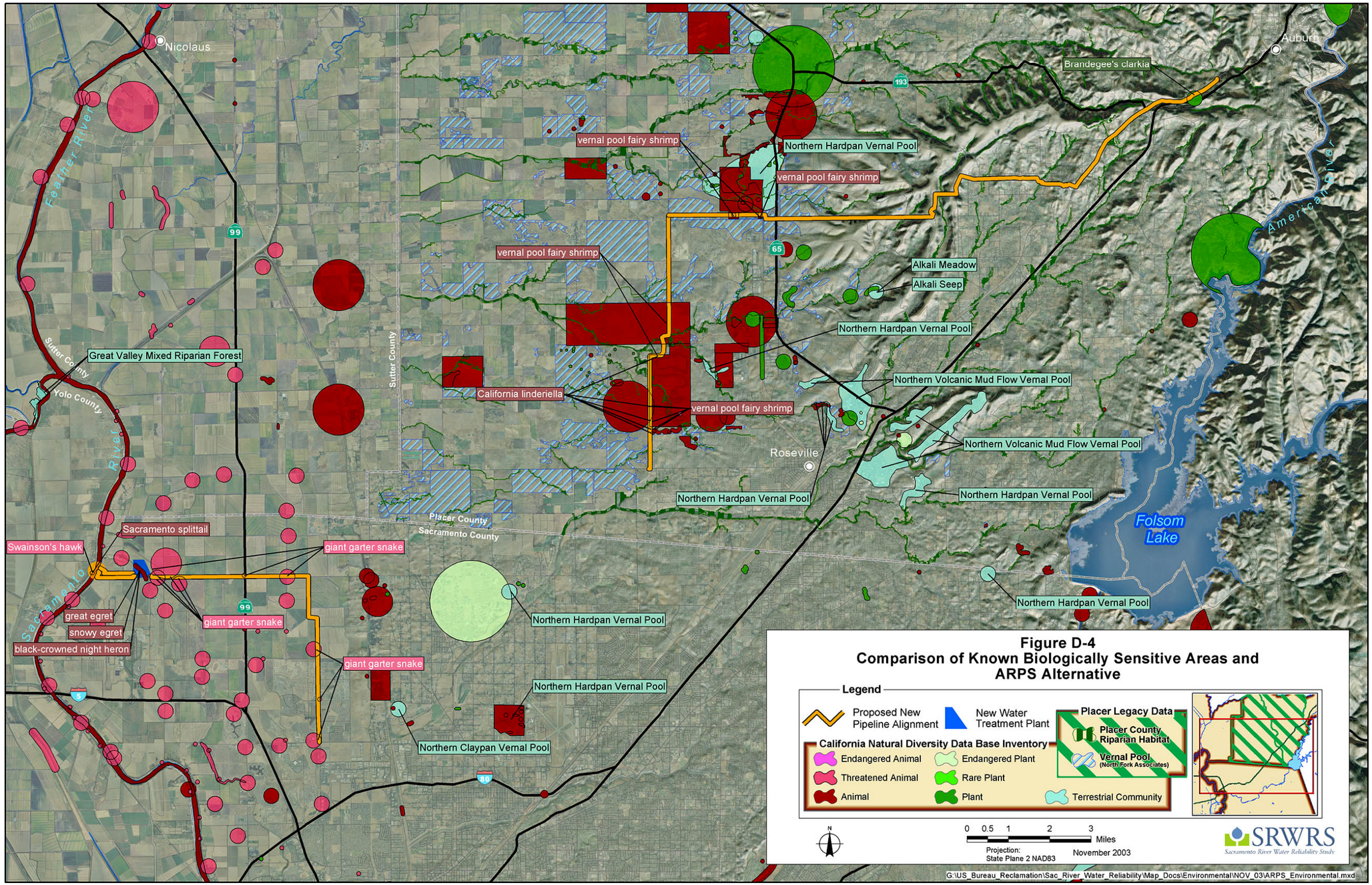
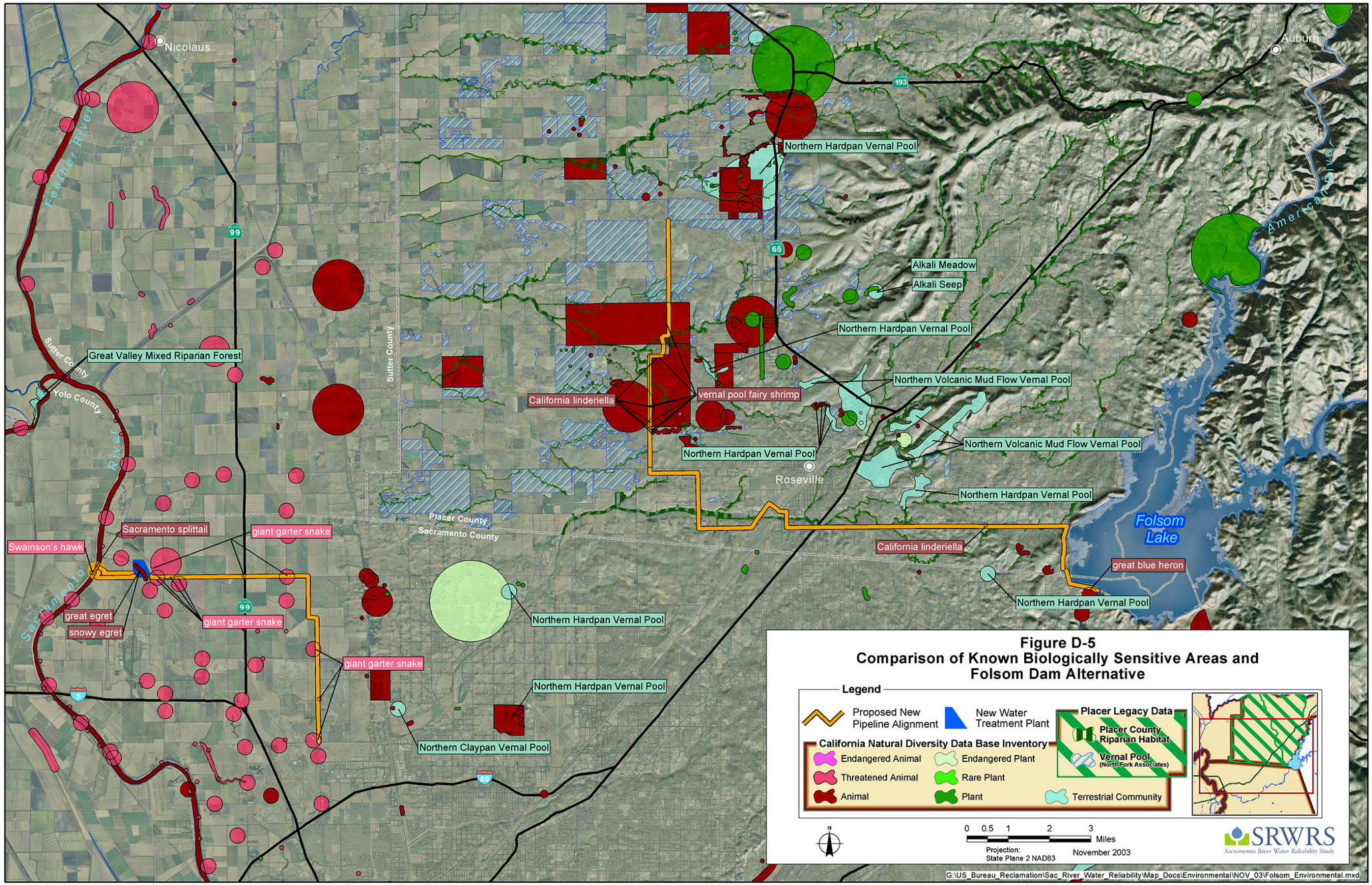


Figure D-5. Comparison of Known Biologically Sensitive Areas and Folsom Dam Alternative



SRWRS
Sacramento River Water Reliability Study

Appendix D, Attachment A
Summary of Tables for Phase 1 Environmental Evaluation of Preliminary Action Alternatives

May 2004

ATTACHMENT A: SUMMARY TABLES FOR PHASE 1 ENVIRONMENTAL EVALUATION OF PRELIMINARY ACTION ALTERNATIVES

Tables D-A1 through D-A5 document the Phase 1 environmental evaluation of major components in the identified five preliminary action alternatives, namely:

- Elkhorn/Elverta Diversion Alternative (Table D-A1)
- Sankey Diversion Alternative (Table D-A2)
- Feather River Diversion Alternative (Table D-A3)
- American River Pump Station (ARPS) Alternative (Table D-A4)
- Folsom Dam Alternative (Table D-A5)

The Phase 1 environmental evaluation was conducted using currently available information, including the California Natural Diversity Database (CNDDB), Placer Legacy Habitat Conservation Plan (HCP) data, and initial field reconnaissance by resource area specialists. As noted in Appendix D, the level of detail in the evaluation is similar to that generally encountered in Initial Studies or Expanded Initial Studies prepared according to the California Environmental Quality Act (CEQA) Guidelines. Additional studies, including specific field surveys and agency consultation, are required to properly describe the potential impacts in all resource area categories.

The potential environmental consequences currently identified through this preliminary screening process could be reduced through further refinements in engineering design, incorporation of mitigation measures in the design, and coordinated planning efforts with Placer County and other planning agencies in the study area. Suggested alternative modifications, refinements, and other opportunities to avoid or reduce potential project-related effects also are presented in Tables D-A1 through D-A5.

The categories used to analyze the potential magnitude of effects for each component of the alternatives under consideration in this screening evaluation for the SRWRS are as follows:

- LME — Potentially Large Magnitude of Effect
- ME — Potentially Small Magnitude of Effect
- ASN— Additional Study Needed

The terminology used in this report to describe potential environmental effects, namely, “Potential Environmental Consequence” or “Magnitude of Effect,” is considered interchangeable with “Potential Impact,” “Potentially Significant Impact,” or “Less Than Significant Impact” (i.e., the terminology normally used in a CEQA Initial Study—although this report is not intended to be an Initial Study). In either case, no final determination or conclusion of impact is assumed in this phase of the study and all reconnaissance-level evaluations will be thoroughly studied and documented in Phase 2.

Table D-A1. Summary of Phase 1 Environmental Evaluation for Elkhorn/Elverta Diversion Alternative

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Diversion Facilities			
Botany	Although no special status plant species are shown on existing databases within the Elkhorn/Elverta Diversion footprint or quad, Delta tule pea, a federal species of concern, was observed at this site during field reconnaissance. The habitat at this location is riparian woodland. Special-status plants potentially occurring within riparian woodland include Sanford's arrowhead, Delta tule pea, and northern California black walnut. Field surveys will be conducted to verify whether any special-status species would be affected by the project.	LME	Opportunities for on-site mitigation for riparian woodlands are limited due to geographic location. Mitigation would likely have to be offsite and the ratio would be high. Avoidance is the preference for Delta tule pea. If this were not possible, a transplanting/mitigation plan may be required. This will be discussed with agencies during Biological Assessment (BA) preparation.
Wildlife	Construction of the diversion facilities will result in the loss of oak/riparian habitat adjacent to the Sacramento River. It is located within the Natomas HCP Swainson's Hawk Zone. This is high-density nesting migratory bird habitat, and may be Swainson's hawk nesting habitat and habitat for the federally threatened giant garter snake. Habitat loss would cause fragmentation and loss of habitat continuity.	LME	Limited due to geography
Fisheries	Potential impacts include: 1) Entrainment/Impingement; and 2) Disturbance of shaded riverine aquatic (SRA) habitat.	LME or ME with mitigation	1) Incorporate fish screen into design features; and 2) need to investigate: (a) engineering design features; and (b) quality of SRA habitat, amount of construction-related disturbance, and potential mitigation requirements.
Water Quality	Potential impacts include 1) construction-related disturbance may cause temporary increase in turbidity; 2) construction-related groundwater dewatering may cause temporary decrease in water quality; and 3) no long-term effects anticipated.	ASN	Implement Best Management Practices (BMP) during construction.

Table D-A1. Summary of Phase 1 Environmental Evaluation for Elkhorn/Elverta Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Diversion Facilities (cont'd)			
Recreation	There are no recreation facilities near the diversion site. The Sacramento River is used for boating, fishing, water-skiing, and other boat-based recreation. The effect on water surface elevations because of the project is anticipated to be negligible. However, the presence of the diversion structure may present an obstacle to navigation. Additional study is needed to determine the significance of potential impacts.	ASN	ASN
Land Use	Land uses around the proposed Elkhorn/Elverta diversion site consist primarily of agricultural operations, with some rural residential uses, an existing pump station, and the Sacramento International Airport located nearby. The proposed diversion facilities are not expected to adversely affect these land uses or conflict with existing plans and policies for the area. It is anticipated that if any conflicts arise with respect to airport plans, they will be resolved through early consultation.	ME	No mitigation required.
(b) Raw Water Pipelines			
Botany	The habitat at this location is primarily agricultural. There are no records of special-status species occurring in the pipeline alignment; however, several special-status plant species are known to occur within the general vicinity (United States Geological Survey (USGS) quad), including dwarf downingia and Boggs Lake hedge-hyssop. These species occur in vernal pools, grasslands, and marshes/swamps. Because the alignment would not impact habitat in which special-status plants occur, these species are not likely to be impacted.	ME	Mitigation not likely to be required.
Wildlife	This corridor crosses lands used for agriculture, which is not important as wildlife habitat, and will be adjacent to Jacobs Slough, which is north of the Sacramento International Airport. Additional study is needed to determine impacts.	ASN	3:1 replacement for marsh habitat loss if any is needed.

Table D-A1. Summary of Phase 1 Environmental Evaluation for Elkhorn/Elverta Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(b) Raw Water Pipelines (cont'd)			
Fisheries	None anticipated.	ME	
Water Quality	None anticipated.	ME	
Recreation	No constraints anticipated.	ME	
Land Use	None anticipated.	ME	No mitigation required.
(c) Water Treatment Facilities			
Botany	The habitat at this location is primarily agricultural. There are no records of special-status species occurring in this quad.	ME	Mitigation not likely to be required.
Wildlife	This site is vegetated with agricultural plants, which are not important as wildlife habitat, and will be adjacent to Jacobs Slough, which is north of the Sacramento International Airport.	ASN	Unknown. Marsh/wetland habitat loss will likely require a 3:1 replacement.
Fisheries	None anticipated.	ME	None anticipated.
Water Quality	None anticipated.	ME	None anticipated.
Recreation	No constraints anticipated	ME	
Land Use	The proposed water treatment facilities would be located on agricultural land designated for Water Treatment Plant (WTP) use. Sacramento County has also identified the site as airport buffer lands, as it falls within the Sacramento International Airport's flight approach zones. The water treatment facility could conflict with a proposed airport expansion project.	ASN	Further information about the potential airport expansion is necessary to determine possible mitigation strategies.

Table D-A1. Summary of Phase 1 Environmental Evaluation for Elkhorn/Elverta Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(d) Treated Water Pipelines			
Botany	No special-status plant species are shown within the alignment on existing databases. Verification in the field will be needed to determine impacts. Special-status plants occurring in quads crossed by the pipeline are dwarf downingia, Boggs Lake hedge-hyssop, big-scale balsamroot, hispid bird's-beak, legenere, Sanford's arrowhead. These species occur in a variety of habitats, including vernal pools and grasslands. The habitat in this alignment may include wetlands such as stream crossings, drainage ditches, and vernal pools. Other special-status species identified that could occur in the project area are California hibiscus, Sacramento Orcutt grass, and pincushion navarettia.	LME	Mitigation would be required for any riparian/wetland and vernal pool impacts. If alignment can be planned to avoid impacting vernal pools, mitigation requirements may be minimized. Mitigation requirements for unavoidable streamside crossings and drainage ditches (e.g., Natomas East Main Drainage Canal) would likely be at a lower ratio than riparian woodlands, but could be extensive if large linear distances are impacted.
Wildlife	The Baseline Road and Fiddyment Road segments of this corridor traverse wetland habitat that may have low to moderate densities of vernal pools and thus may support the federally threatened vernal pool fairy shrimp, California tiger salamander. This habitat appears to be more likely and in greater aerial extent along the southern edge of Baseline Road. Giant garter snakes are likely near canals, rice fields and standing water.	LME	Impacts would be mitigatable. Pipeline corridor surfaces could be surfaced to develop wetland and vernal pool habitat as mitigation and/or enhancement. Placement of the pipeline on the northern side of Baseline Road would reduce potential impacts to vernal pools and associated sensitive species. (Another option is to minimize impacts by coordinating with development activities in Placer County.).
Fisheries	1) Disturbance of riparian and shaded riverine aquatic (SRA) habitat along several miles of Natomas East Main Drainage Canal where new pipeline alignment runs parallel to stream; and 2) new pipeline alignments would cross several potentially fish-bearing streams, including Dry Creek and Pleasant Grove Creek.	LME	1) Need to investigate: (a) engineering design features; and (b) quality of existing SRA habitat, amount of construction-related disturbance along Natomas East Main Drainage Canal, and potential mitigation requirements; and 2) presence/absence of anadromous and/or resident fish in streams where pipeline crossing would occur.
Water Quality	1) Construction-related disturbance may cause temporary increase in turbidity, 2) construction-related groundwater dewatering may cause temporary decrease in water quality, and 3) no long-term effects anticipated.	ME with mitigation	Implement BMPs during construction.

Table D-A1. Summary of Phase 1 Environmental Evaluation for Elkhorn/Elverta Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(d) Treated Water Pipelines (cont'd)			
Recreation	None anticipated.	ME	
Land Use	None anticipated.	ME	No mitigation required.
(e) Operations			
Botany	Operation of this alternative is not expected to significantly impact botanical resources.	ME	None necessary.
Wildlife	Operations of the diversion will likely produce noise and have nocturnal lighting – both may have an insignificant impact on wildlife.	ME	None necessary.
Fisheries	Anadromous and Resident Riverine Species –Changes in flow, water temperature, and reduced early lifestage salmon survival. (Note: Changes in the timing, magnitude and frequency of these parameters, as they occur throughout the Central Valley Project/State Water Project (CVP/SWP) system, are unknown without hydrologic modeling.) Warmwater Reservoir Fisheries – Changes in reservoir water surface elevation and littoral habitat affecting spawning and rearing. Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. Coldwater Reservoir Fisheries – Changes in reservoir storage impacting long-term population levels. Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. There is a potential to increase the volume of effluent discharge to fish-bearing streams.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. Need to determine specifics of the operational pattern of the diversion (e.g., will water be withdrawn at a constant rate, will timing be annual or seasonal, what other conditions associated with the diversion could have an influence on CVP/SWP operations). This alternative's location in the watershed likely would provide a reduced amount of potential impacts to riverine fisheries resources relative to other alternatives because this section of the Sacramento River is primarily used as a migration corridor. Most of the anadromous fish spawning and rearing habitat is upstream and would not likely be affected by diverting at this site.

Table D-A1. Summary of Phase 1 Environmental Evaluation for Elkhorn/Elverta Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(e) Operations (cont'd)			
Water Quality	Reduced downstream dilution potential for pollutants and surface water quality parameters of concern.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. Because water quality in the Sacramento River is generally considered to be of lesser quality than water from the lower American River, potential water quality impacts from this alternative could be of smaller consequence relative to other alternatives under consideration involving diversions from the American River.
Recreation	There may be some additional noise to boaters on the river from pumping operations. Protrusion of the diversion structure may be a significant impact.	ASN	ASN
Land Use	There may be some additional noise affecting nearby residences resulting from the pumping operations but this is not considered a significant impact.	ME	

Categories of potential magnitude of effects and mitigation:

- LME Potentially Large Magnitude of Effect
- ME Potentially Small Magnitude of Effect
- ASN Additional Study Needed

Table D-A2. Summary of Phase 1 Environmental Evaluation for Sankey Diversion Alternative

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Diversion Facilities			
Botany	No special-status plant species are shown on existing databases within the footprint. The habitat at this location is riparian woodland, but more disturbed, less well-developed, and a narrower corridor than Elkhorn/Elverta location. Special-status plants potentially occurring within riparian woodland at the proposed Sankey Diversion include Sanford's arrowhead, Delta tule pea, and California rose mallow.	LME	Limited opportunities for on-site mitigation due to geographic location. Mitigation ratio would be high for riparian woodlands. Mitigation requirements likely to be less than for Elkhorn/Elverta Diversion.
Wildlife	The Sankey Diversion would have less terrestrial wildlife impact than Elkhorn/Elverta because the extent of existing riparian is less. Habitat conditions in the vicinity of the Sankey Diversion have a greater potential for the federally threatened giant garter snake. The habitat is also migratory nesting bird habitat, and may support Swainson's hawks, and is within the Natomas HCP Swainson's Hawk Zone. Habitat fragmentation may be an issue. Cliff swallows nest in abundance on the bridges crossing Sankey Road and across the adjacent canal.	LME	Impacts would be mitigatable, but likely require replacement of riparian habitat, Swainson's hawk habitat, and giant garter snake habitat
Fisheries	1) Entrainment/Impingement; and 2) disturbance of SRA habitat.	LME or ME with mitigation	1) Incorporate fish screen into design features; and 2) need to investigate: (a) engineering design features; and (b) quality of SRA habitat, amount of construction-related disturbance, and potential mitigation requirements.
Water Quality	1) Construction-related disturbance may cause temporary increase in turbidity; 2) construction-related groundwater dewatering may cause temporary decrease in water quality; and 3) no long-term effects anticipated.	ASN	Implement BMPs during construction.

Table D-A2. Summary of Phase 1 Environmental Evaluation for Sankey Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Diversion Facilities (cont'd)			
Recreation	Existing nearby recreation facilities include the privately operated Verona Village River Resort with a marina, waterfront restaurant, convenience store, and recreational mobile park. However, the diversion location is far enough south to prevent any direct impacts to these facilities. The Sacramento River is used for boating, fishing, water-skiing, and other boat-based recreational activities. The effect on water surface elevations as a result of the project is anticipated to be negligible. However, the presence of the diversion facilities may result in some reduction of quality of the recreational experience. Additional study is needed to determine the extent of impacts.	ASN	ASN
Land Use	A restaurant, marina, grocery store, and mobile home park/recreational vehicle campground are located north of the proposed Sankey diversion site. Development of the proposed diversion facilities is not expected to adversely affect these land uses or conflict with existing plans and policies for the area.	ME	No mitigation required.
(b) Raw Water Pipelines			
Botany	No special-status plant species are shown on existing databases within the proposed alignment. Special-status plants known to occur in quads crossed by the pipeline are: dwarf downingia and Boggs Lake hedge-hyssop. These species occur in vernal pools, grasslands, and marshes/swamps. The habitat in this alignment may include wetlands such as stream crossings, drainage ditches, and vernal pools.	LME	Mitigation would be required for any riparian/wetland and vernal pool impacts. If alignment can be planned to avoid impacting vernal pools, mitigation requirements may be minimized. Mitigation requirements for unavoidable streamside crossings and drainage ditches would likely be at a lower ratio than riparian woodlands but could be extensive if large linear distances are impacted.
Wildlife	Most of this corridor is used for agriculture; important resources are likely to be absent. There is a possibility of wetlands and vernal pool habitat west of the treatment facility location.	ME	

Table D-A2. Summary of Phase 1 Environmental Evaluation for Sankey Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(b) Raw Water Pipelines (cont'd)			
Fisheries	New pipeline alignments would cross several potentially fish-bearing streams, including Cross Canal/Curry Creek.	LME	Need to investigate: 1) engineering design features to determine how stream crossings will be addressed; and 2) determine the presence/absence of anadromous and/or resident fish for potential pipeline construction disturbances.
Water Quality	1) Construction-related disturbance may cause temporary increase in turbidity; 2) construction-related groundwater dewatering may cause temporary decrease in water quality; and 3) no long-term affects anticipated.	ME with mitigation	Implement BMPs during construction.
Recreation	None anticipated.	ME	
Land Use	The proposed pipeline would likely be routed through an area presently in agricultural and industrial use, and designated for future industrial and commercial development. The pipeline is not expected to significantly affect land uses or conflict with existing plans and policies for this area.	ME	No mitigation required.
(c) Water Treatment Facilities			
Botany	No special-status plant species are shown on existing databases within the proposed alignment. Special-status species known to occur in quads crossed by the pipeline are dwarf downingia and Boggs Lake hedge-hyssop. These species occur in vernal pools, grasslands, and marshes/swamps. This site is near vernal pools, but appears to be located on agricultural land. If vernal pools are avoided, botanical impacts are likely to be minimal.	LME	Mitigation would not be required if impacts to vernal pools are avoided.

Wildlife	The Sankey WTP site is agricultural land and therefore has limited wildlife habitat value. However, the adjacent canal has potential for vernal pools species and the giant garter snake. Giant garter snakes are likely associated with canals and rice fields. Burrowing owls, a species of special concern, may also be present on or near the site	ASN Potentially significant impacts if vernal pools, vernal pool fairy shrimp species, and tiger salamanders are present.	Acquisition of land adjacent to the WTP for mitigation could be considered. It could be used to create habitat enhancement to off-set or compensate for any significant impacts.

Table D-A2. Summary of Phase 1 Environmental Evaluation for Sankey Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(c) Water Treatment Facilities (cont'd)			
Fisheries	NA	NA	NA
Water Quality	NA	NA	NA
Recreation	None anticipated.	ME	
Land Use	The proposed WTP would be near the southwest corner of Placer County, in an area with mainly agricultural and rural residential uses, with some nearby urban development. The WTP may conflict with existing residential uses.	ASN	Needs further investigation. If potential conflicts with adjacent residential uses are uncovered, early consultation should result in a consensus on mitigation.
(d) Treated Water Pipelines			
Botany	The planned pipeline alignment would be adjacent to or intersect a known occurrence of dwarf downingia — a special-status vernal pool species. Other special status plants occurring in quads crossed by the pipeline are Boggs Lake hedge-hyssop, big-scale balsamroot, hispid bird's-beak, legenere. These species occur in a variety of habitats, including vernal pools and grasslands. The habitat in this alignment may include wetlands such as drainage ditches, stream crossings, and vernal pools.	LME	Mitigation would be required for any riparian/wetland and vernal pool impacts. If alignment can be planned to avoid impacting dwarf downingia and vernal pools, mitigation requirements may be minimized. Mitigation requirements for unavoidable streamside crossings and drainage ditches would likely be at a lower ratio than riparian woodlands, but could be extensive if large linear distances are impacted.
Wildlife	Portions of this corridor traverse areas of low to moderate vernal pool habitat. These may support federally listed vernal pool fairy shrimp species and California tiger salamander. Canals and rice fields may also support the giant garter snake. Canals may support western pond turtles. Burrowing owls are also possible along most of the pipeline corridor.	ASN Unknown at this time. Impact to any of these resources would be significant.	Linear project offers potential for habitat establishment and/or enhancement through treatment of finished grade and surface.

Fisheries	New pipeline alignments would cross several potentially fish-bearing streams, including Dry Creek and Pleasant Grove Creek.	LME	Need to investigate: 1) engineering design features to determine how stream crossings will be addressed; and 2) determine the presence/absence of anadromous and/or resident fish for potential pipeline construction disturbances.

Table D-A2. Summary of Phase 1 Environmental Evaluation for Sankey Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(d) Treated Water Pipelines (cont'd)			
Water Quality	1) Construction-related disturbance may cause temporary increase in turbidity; 2) construction-related groundwater dewatering may cause temporary decrease in water quality; and 3) no long-term affects anticipated.	ME with mitigation	Implement BMPs during construction.
Recreation	None anticipated.		
Land Use	None anticipated.	ME	No mitigation required.
(e) Operations			
Botany	None anticipated.	ME	No mitigation required.
Wildlife	Nocturnal lighting and facility-generated noise is likely to have an insignificant effect on wildlife in this area.	ME	No mitigation required.
Fisheries	Anadromous and Resident Riverine Species – Changes in flow, water temperature, and reduced early lifestage salmon survival. (Note: Changes in the timing, magnitude, and frequency of these parameters, as they occur throughout the CVP/SWP system, are unknown without hydrologic modeling.) Warmwater Reservoir Fisheries – Changes in reservoir water surface elevation and littoral habitat affecting spawning and rearing. Reservoirs under consideration include: Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. Coldwater Reservoir Fisheries – Changes in reservoir storage impacting long-term population levels. Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. There is a potential to increase the volume of effluent discharge to fish-bearing streams.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. Need to determine specifics of the operational pattern of the diversion (e.g., will water be withdrawn at a constant rate, will timing be annual or seasonal, what other conditions associated with the diversion could have an influence on CVP/SWP operations). This alternative's location in the watershed likely would result in a reduced amount of potential impacts to riverine fisheries resources relative to other alternatives because this section of the Sacramento River primarily is used as a migration corridor. Most of the anadromous fish spawning and rearing habitat is located upstream and would not likely be affected by diverting at this site.

Table D-A2. Summary of Phase 1 Environmental Evaluation for Sankey Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(e) Operations (cont'd)			
Water Quality	Reduced downstream dilution potential for pollutants and surface water quality parameters of concern.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. Because water quality in the Sacramento River is generally considered to be of lesser quality than water from the lower American River, potential water quality impacts from this alternative could be of smaller consequence relative to other alternatives under consideration.
Recreation	None anticipated.	ME	
Land Use	None anticipated.	ME	
(f) Elkhorn/Elverta Module - See Elkhorn/Elverta Diversion Alternative			

Categories of potential magnitude of effects and mitigation:

LME Potentially Large Magnitude of Effect
ME Potentially Small Magnitude of Effect
ASN Additional Study Needed

Table D-3. Summary of Phase 1 Environmental Evaluation for Feather River Diversion Alternative

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Diversion Facilities			
Botany	There are no records of special-status species occurring in the diversion footprint. However, the Delta tule pea — a federal species of concern — was observed at this site during field reconnaissance. One special-status plant species is known to occur within this quad: dwarf downingia. This species occurs in a valley and foothill grassland, and vernal pools. This footprint would impact extensive high-quality riparian woodland and marsh habitat. Numerous other sensitive wetland/riparian plant species have potential to occur in this area.	LME	Extensive mitigation would be required for impacts to riparian woodlands and adjacent marsh wetland. This area has high potential to support sensitive plant species. It is unlikely that feasible mitigation would be possible for the anticipated impacts to the ecosystem.
Wildlife	The proximity of this site to an established wildlife preserve known to support significant sensitive biological resources has the potential for greater levels of significant terrestrial biological resource impacts than any of the other alternative diversions. Potentially significant impacts to wildlife area and its inhabitants, including Swainson's hawk, giant garter snake, valley elderberry longhorn beetle, bank swallows, western pond turtle.	LME	MI Potential impacts to terrestrial biological resources could be difficult and expensive to mitigate. This site has greater ecological diversity and thus, more potential issues than other alternative diversion sites. In addition to biological impacts, development of this site could bring significant public opposition, particularly from those associated with concerns for biological resource protection.
Fisheries	1) Entrainment/impingement; and 2) disturbance of SRA habitat.	LME or ME with mitigation	1) Incorporate fish screen into design features; and 2) need to investigate: (a) engineering design features; and (b) quality of SRA habitat, amount of construction-related disturbance, and potential mitigation requirements. (Higher quality SRA habitat at this location may require extensive mitigation relative to other alternatives under consideration.)

Table D-A3. Summary of Phase 1 Environmental Evaluation for Feather River Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements /Avoidance Options
(a) Diversion Facilities (cont'd)			
Water Quality	1) Construction-related disturbance may cause temporary increase in turbidity; 2) Construction-related groundwater dewatering may cause temporary decrease in water quality; and 3) no long-term effects anticipated.	ASN	Implement BMPs during construction.
Recreation	The Feather River Wildlife Area is immediately adjacent to the diversion site. Bobelaine Ecological Reserve, located within 1 mile upstream of the diversion has 5 miles of signed and maintained trails that run through climax oak grassland, open grassland, sloughs, and a lake, and through mixed riparian woodland. Facilities also include a portable toilet, parking for vehicles and school buses, and three picnic areas with running water. An informal gravel walking path is at the top of the levee closest to the south bank of the river. Any potential effect on the Bobelaine Ecological Reserve would be considered a significant impact	LME	Because of the dependence of the recreational experience on an ecological community at the reserve, mitigation that would require recreation of the community would be difficult or impossible.
Land Use	None anticipated.	ME	No mitigation required.
(b) Raw Water Pipelines			
Botany	There are no known occurrences of special-status plants within the pipeline alignment. Special-status plants occurring in quads crossed by the pipeline are dwarf downingia, Boggs Lake hedge-hyssop, big-scale balsamroot, hispid bird's-beak, legenere, Ahart's dwarf rush, Brandegee's clarkia. These species occur in a variety of habitats, including vernal pools, grasslands, marsh, chaparral, and woodlands. The habitat in this alignment may include wetlands such as drainage ditches, stream crossings, and vernal pools.	ASN	Mitigation would be required for any riparian/wetland and vernal pool impacts. If alignment can be planned to avoid impacting vernal pools, mitigation requirements may be minimized. Mitigation requirements for unavoidable streamside crossings and drainage ditches would likely be at a lower ratio than for riparian woodlands but could be extensive if large linear distances are impacted.

Table D-A3. Summary of Phase 1 Environmental Evaluation for Feather River Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/ Avoidance Options
(b) Raw Water Pipelines (cont'd)			
Wildlife	Much of this corridor is used for agriculture, but areas along this corridor support riparian and standing water habitats, including rice fields, and thus have potential for the federally threatened giant garter snakes, western pond turtles, and burrowing owls.	ASN Potentially significant, but proximity of the pipeline to paved roads and the limited footprint may help reduce the level of potential significance.	Treatment of finished grade and surface of the pipeline construction area offer opportunities to establish and/or enhance habitat for sensitive species and vernal pools.
Fisheries	None anticipated.	ME	None anticipated.
Water Quality	None anticipated.	ME	None anticipated.
Recreation	None anticipated.	ME	None anticipated.
Land Use	None anticipated.	ME	No mitigation required.
(c) Water Treatment Facilities			
Botany	There are no records of special-status species occurring in the WTP footprint. One special-status plant species is known to occur within this quad: dwarf downingia. This species occurs in a valley and foothill grassland, and vernal pools. The habitat at the proposed location of the water treatment facility is unknown but is not likely to support vernal pools.	ME	Mitigation not likely to be required.
Wildlife	Likely to be limited.	ME	Habitat enhancement may be possible to offset potentially significant impacts if surplus lands are available for such treatment.
Fisheries	None anticipated.	ME	None anticipated.
Water Quality	None anticipated.	ME	None anticipated.
Recreation	None anticipated.	ME	None anticipated.
Land Use	The proposed WTP would be located in an area composed of agricultural and rural residential uses.	ME	

Table D-A3. Summary of Phase 1 Environmental Evaluation for Feather River Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements /Avoidance Options
(d) Treated Water Pipelines			
Wildlife	Segments of this corridor will likely traverse areas with low to moderate density of vernal pools. These areas are present along the northern edge of Nicolaus Road and along the north-south alignment adjacent to Fiddyment Road. The potential exists for vernal pool fairy shrimp species, and the Californian tiger salamander is present. Giant garter snakes, valley elderberry longhorn beetle habitat, western pond turtles, and burrowing owls are also potential inhabitants of these areas.	ASN Possibly significant if these resources are present and are likely to be impacted.	Treatment of finished grade and surface of the pipeline construction area offer opportunities to establish and/or enhance habitat for sensitive species and vernal pools.
Fisheries	The new pipeline alignment would cross several potentially fish-bearing streams, including Dry Creek, Pleasant Grove Creek, Markham Ravine, Auburn Ravine, and Orchard Creek.	LME	Need to investigate: 1) engineering design features to determine how stream crossings will be addressed; and 2) determine the presence/absence of anadromous and/or resident fish for potential pipeline construction disturbances.
Water Quality	1) Construction-related disturbance may cause temporary increase in turbidity; 2) construction-related groundwater dewatering may cause temporary decrease in water quality; and 3) no long-term affects anticipated.	ME with mitigation	Implement BMPs during construction.
Recreation	None anticipated.	ME	
Land Use	None anticipated. .	ME	
(e) Operations			
Botany	Not likely to be significant.	ME	No mitigation would be required.
Wildlife	Nocturnal lighting and operation-generated noise may adversely affect special status wildlife species. The potential level of impact will need careful review because of the diversity and high population levels of sensitive wildlife receptors.	ME	

Table D-A3. Summary of Phase 1 Environmental Evaluation for Feather River Diversion Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(e) Operations (cont'd)			
Fisheries	Anadromous and Resident Riverine Species— Changes in flow, water temperature, and reduced early lifestage salmon survival. (Note: Changes in the timing, magnitude and frequency of these parameters, as they occur throughout the CVP/SWP system, are unknown without hydrologic modeling.) Warmwater Reservoir Fisheries – Changes in reservoir water surface elevation and littoral habitat affecting spawning and rearing. Reservoirs under consideration include Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. Coldwater Reservoir Fisheries – Changes in reservoir storage impacting long-term population levels. Reservoirs under consideration include: Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. There is a potential to increase the volume of effluent discharge to fish-bearing streams.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. Need to determine specifics of the operational pattern of the diversion (e.g., will water be withdrawn at a constant rate, will timing be annual or seasonal, what other conditions associated with the diversion could have an influence on CVP/SWP operations).
Water Quality	Reduced downstream dilution potential for pollutants and surface water quality parameters of concern. Extensive raw water pipeline length may affect raw water pipeline operations and maintenance.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. (Because water quality near the mouth of the Feather River is generally considered to be of lesser quality than water from the lower American River, potential water quality impacts from this alternative could be of smaller consequence relative to other alternatives under consideration.)
Recreation	None anticipated.	ME	
Land Use	None anticipated.	ME	
(f) Elkhorn/Elverta Module - See Elkhorn/Elverta Diversion Alternative			

Categories of potential magnitude of effects and mitigation:
- LME Potentially Large Magnitude of Effect
- ME Potentially Small Magnitude of Effect
- ASN Additional Study Needed

Table D-A4. Summary of Phase 1 Environmental Evaluation for ARPS Alternative

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Diversion Facilities			
Botany	The footprint of the pump station would not change, so there would be no construction impacts. Mitigation already addressed through pre-approved project.	ME	Additional mitigation not likely to be required for construction.
Wildlife	Addition of new pumping capacity will be within the footprint of the planned, permitted, and mitigated development, impacts should be limited	ASN	N/A
Fisheries	Entrainment/Impingement.	LME or ME with mitigation	None required. (Fish screen already has been incorporated into PCWA's design features for the permanent pump station facilities.)
Water Quality	1) Absence of construction-related activities would result in no disturbance or short-term impacts; and 2) no long-term affects anticipated.	ASN	None identified at this time.
Recreation	The American River Pump Station (ARPS) is within the 35,000-acre Auburn State Recreation Area (Auburn SRA). Current recreational uses in the vicinity of the intake include hiking, horseback riding, mountain biking, fishing, swimming, rafting, and kayaking. Formal recreation facilities include trails and signage, and a 70-vehicle parking area is planned about 1-2 miles downstream. Construction of the permanent ARPS has been approved and mitigation measures for recreation impacts have been incorporated in that project. Because of a potential reduction in water flows as a result of the project in extremely dry years, additional study is needed to determine any potential effects.	ASN	ASN

Table D-A4. Summary of Phase 1 Environmental Evaluation for ARPS Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Land Use			
	Land uses at and around the American River site include an existing seasonal pump station and pipeline; the partially completed Auburn Dam facilities; and unpaved access roads cut into the hillside. Large expanses of rugged, forested open space border the site, and the recreational trails of Auburn State Recreation Area traverse the surrounding hillsides. Farther away, some residential development is situated on the neighboring hills. The proposed diversion facilities are not expected to adversely affect these land uses or conflict with existing plans and policies for the area.	ME	No mitigation required.
(b) Water Treatment Facilities			
Botany	There are no special status-plant species shown on existing databases within the WTP footprint.	ME	Mitigation not likely to be necessary.
Wildlife	Valley elderberry longhorn beetle habitat, western pond turtles and several bird species of special concern may be present in the vicinity of the Phase 2 Expansion facility and the Sunset WTP site.	ASN Potentially locally significant if these sensitive resources are present.	Mitigation is possible; habitat enhancement is also possible, if needed to compensate for project impact.s
Fisheries	No constraints anticipated.	ME	None identified at this time.
Water Quality	1) Absence of construction-related activities would result in no disturbance or short-term impacts; and 2) no long-term affects anticipated.	ME	None identified at this time.
Recreation	No constraints anticipated.	ME	
Land Use	No significant land use impacts are anticipated.	ME	None identified at this time.

Table D-A4. Summary of Phase 1 Environmental Evaluation for ARPS Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(c) Treated Water Pipelines			
	The planned pipeline alignment would be adjacent to or intersect a known occurrence of Brandegee's clarkia – a chaparral, cismontaine woodland species. Special-status plants occurring in quads crossed by the pipeline are dwarf downingia, Boggs Lake hedge-hyssop, big-scale balsamroot, hispid bird's-beak, legenere, Brandegee's clarkia, and dubious pea. These species occur in a variety of habitats, including vernal pools, grasslands, marsh, chaparral, and woodlands. The habitat in this alignment may include wetlands such as stream crossings, drainage ditches, and vernal pools. A dense distribution of vernal pools occurs at the west end of the pipeline. Other special-status species with potential to occur in the project area are predominantly associated with ultramafic soils and include Stebbins's morning-glory and Pine Hill ceanothus. However, much of the area is included in proposed developments that have either been approved or are in the process of approval in the City of Roseville; associated mitigation measures would be incorporated in those project approvals. In addition, the pipeline alignment could be moved within the corridor to avoid areas of sensitive species.	ME	Mitigation would be required for any riparian/wetland and vernal pool impacts. If alignment can be sited to avoid impacting Brandegee's clarkia and vernal pools, mitigation requirements may be minimized. Mitigation requirements for unavoidable streamside crossings and drainage ditches would likely be at a lower ratio than riparian woodlands but could be extensive if large linear distances are impacted.

Table D-A4. Summary of Phase 1 Environmental Evaluation for ARPS Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(c) Treated Water Pipelines (cont'd)			
Wildlife	The pipeline corridor between the Phase 2 WTP and Sunset WTP may affect habitats for the valley elderberry longhorn beetle, western pond turtle, and burrowing owl. The corridor between the Sunset WTP and west of Highway 65 will traverse areas mapped by the Placer Legacy as moderate and high-density vernal pool habitat. These areas may support federally threatened species of vernal pool fairy shrimp species, California tiger salamander, giant garter snakes, and burrowing owls. Much of this area is targeted for planned development. These developments may have mitigation incorporated into their development plans, which could potentially reduce required pipeline mitigation significantly.	ME Potentially significant, particularly if high and moderate density vernal pool habitat is disrupted. The proximity of the pipeline to existing roads will be mitigating condition.	Treatment of finished grade and surface of the pipeline construction area offer opportunities to establish and/or enhance habitat for sensitive species and vernal pools. Lost habitat would have to be replaced at a ratio required by the USFWS and California Department of Fish and Game (CDFG), generally 3:1.
Fisheries	New pipeline alignment would cross several potentially fish-bearing streams, including Pleasant Grove Creek and Clover Valley Creek near Newcastle.	LME	Need to investigate: 1) engineering design features to determine how stream crossings will be addressed; and 2) determine the presence/ absence of anadromous and/or resident fish for potential pipeline construction disturbances.
Water Quality	1) Construction-related disturbance may cause temporary increase in turbidity; 2) construction-related groundwater dewatering may cause temporary decrease in water quality; and 3) no long-term affects anticipated.	ME with mitigation	Implement BMPs during construction.
Recreation	None anticipated.	ME	
Land Use	None anticipated.	ME	No mitigation required.
(d) Operations			
Botany	There may be some downstream impacts to riparian vegetation from project operations. Decrease in flows could decrease scour and result in riparian vegetation recruitment downstream. Long-term impacts to vegetation could be different.	ASN	Further study needed on operational impacts to determine potential impacts.

Table D-A4. Summary of Phase 1 Environmental Evaluation for ARPS Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(d) Operations (cont'd)			
Wildlife	Reduced river flows and changed flow regimes may benefit early establishment of riparian habitat and thereby benefit wildlife. However, changed geomorphology as a result of project may affect long-term riparian habitat recruitment.	ASN	
Fisheries	Anadromous and Resident Riverine Species –Changes in flow, water temperature, and reduced early lifestage salmon survival. (Note: Changes in the timing, magnitude, and frequency of these parameters as they occur throughout the CVP/SWP system are unknown without hydrologic modeling.) Warmwater Reservoir Fisheries – Changes in reservoir water surface elevation and littoral habitat affecting spawning and rearing. Reservoirs under consideration include Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. Coldwater Reservoir Fisheries – Changes in reservoir storage impacting long-term population levels. Reservoirs under consideration include Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. There is a potential to increase the volume of effluent discharge to fish-bearing streams.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. Need to determine specifics of the operational pattern of the diversion (e.g., will water be withdrawn at a constant rate, will timing be annual or seasonal, what other conditions associated with the diversion could have an influence on CVP/SWP operations). This alternative's location in the watershed likely would result in greater potential impacts to riverine fisheries resources relative to alternatives along the Sacramento River and the Feather River because the entire 23-mile length of the lower American River is used by anadromous fish for migration, spawning, and rearing.
Water Quality	1) Reduced downstream dilution potential for pollutants and surface water quality parameters of concern; and 2) increased mobilization of groundwater contaminants.	ASN Unknown without hydrologic modeling, additional analysis required.	Not yet able to be identified. Because water quality in the lower American River is generally considered to be of better quality than water from the Sacramento River, potential water quality impacts from this alternative could be of greater consequence relative to other alternatives under consideration.

Table D-A4. Summary of Phase 1 Environmental Evaluation for ARPS Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
Recreation	Although significant impacts to recreation activities or facilities are not anticipated, previously expressed concern of recreationists in this area about potential impacts will necessitate additional study.	ASN	ASN
Land Use	None anticipated.	ME	None anticipated.
(e) Elkhorn/Elverta Module - See Elkhorn/Elverta Diversion Alternative			

Categories of potential magnitude of effects and mitigation:

LME Potentially Large Magnitude of Effect
ME Potentially Small Magnitude of Effect
ASN Additional Study Needed

Table D-A5. Summary of Phase 1 Environmental Evaluation for Folsom Dam Alternative

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Diversion Facilities			
Botany	No special-status plant species are shown on existing databases within the diversion footprint. Several-special status plants are known to occur in this quad, including pincushion navarretia, and Sacramento Orcutt grass. These species occur in vernal pools (not likely to occur in diversion facility footprint). The habitat in this primarily oak woodland. Field recon and habitat mapping for American River Watershed Study show this area as primarily developed. Because footprint would not impact habitat in which special-status plants occur, these species are not likely to be impacted.	ME	Mitigation not likely to be required.
Wildlife	Little or no terrestrial impact other than construction-related noise, dust, traffic, etc.	ME	
Fisheries	Entrainment/impingement.	ME with mitigation	Incorporate fish screen into design features.
	Water Quality	ASN	Implement BMPs during construction.
Recreation	Folsom Reservoir is entirely within the Folsom Reservoir State Recreation Area (Folsom SRA). The lower American River from Nimbus Dam to its confluence with the Sacramento River is designated a “recreational river” by the federal and state governments under the National Wild and Scenic Rivers Act. Approximately 29 miles of the lower American River from Folsom Dam to the confluence with the Sacramento River is included in the city of Sacramento’s American River Parkway Plan. Because of a potential reduction in water flows as a result of the project in extremely dry years, additional study is needed to determine any potential effects.	ASN	ASN

Table D-A5. Summary of Phase 1 Environmental Evaluation for Folsom Dam Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(a) Diversion Facilities (cont'd)			
Land Use	Surrounding land uses include Folsom Reservoir State Recreation Area, Folsom Dam Road, and residential and commercial development in the Granite Bay community of Placer County and the City of Folsom. An additional intake at Folsom Dam is not expected to adversely affect these land uses or conflict with existing plans and policies for the area.	ME	No mitigation required.
(b) Raw Water Pipelines			
Botany	Very small, disturbed area.	ME	Mitigation would not be required.
Wildlife	Limited impact within an existing disturbed corridor.	ME	N/A
Fisheries	None anticipated.		None anticipated.
Water Quality	1) Construction-related disturbance may cause temporary increase in turbidity; 2) construction-related groundwater dewatering may cause temporary decrease in water quality; and 3) no long-term affects anticipated.	ASN	Implement BMPs during construction.
Recreation	Additional study needed.	ASN	
Land Use	None anticipated.	ME	No mitigation required.

Table D-A5. Summary of Phase 1 Environmental Evaluation for Folsom Dam Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(c) Water Treatment Facilities			
Botany	No special-status plant species are shown on existing databases within the treatment facility footprint. Several special-status plants are known to occur in this quad, including pincushion navarretia, and Sacramento Orcutt grass. These species occur in vernal pools (not likely to occur in diversion facility footprint). The habitat is primarily oak woodland. Field reconnaissance and habitat mapping for the American River Watershed Study show this area as primarily developed. Because the footprint would not impact habitat in which special-status plants occur, these species are not likely to be impacted.	ME	Mitigation not likely to be required.
Wildlife	There are no special-status wildlife species in the WTP area, so no impacts are anticipated.	ME	None anticipated.
Fisheries	None anticipated.	ME	None anticipated.
Water Quality	1) Absence of construction-related activities would result in no disturbance or short-term impacts; and 2) no long-term affects anticipated.	ME	None anticipated.
Recreation	None anticipated.	ME	None anticipated.
Land Use	None anticipated, but further study required to determine consistency with applicable plans and policies.	ASN	None anticipated.

Table D-A5. Summary of Phase 1 Environmental Evaluation for Folsom Dam Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(d) Treated Water Pipelines			
Botany	No special-status species are shown on existing databases within the alignment. Several special-status plant species are known to occur in quads crossed by the pipeline: dwarf downingia, Boggs Lake hedge-hyssop, big-scale balsamroot, hispid bird's-beak, legenere, Sanford's arrowhead. These species occur in a variety of habitats, including vernal pools, grasslands, and marsh. The eastern terminus of the pipeline is developed. The habitat in the other portions of this alignment may include wetlands such as stream crossings, drainage ditches, and vernal pools.	ME	Mitigation would be required for any riparian/wetland and vernal pool impacts. If alignment can be planned to avoid impacting vernal pools, mitigation requirements may be minimized. Mitigation requirements for unavoidable streamside crossings and drainage ditches would likely be at a lower ratio than riparian woodlands, but could be extensive if large linear distances are impacted.
Wildlife	Expansion of existing facilities will likely only have limited, localized construction-related noise, dust, traffic impacts.	ME	None anticipated.
Fisheries	New pipeline alignments would cross several potentially fish-bearing streams, including Pleasant Grove Creek and Dry Creek.	LME	Need to investigate: 1) engineering design features to determine how stream crossings will be addressed; and 2) determine the presence/ absence of anadromous and/or resident fish for potential pipeline construction disturbances.
Water Quality	None anticipated.	ME	None anticipated.
Recreation	No constraints anticipated.	ME	
Land Use	None anticipated.	ME	No mitigation required.
(e) Operations			
Botany	None expected.	ME	Mitigation would not be required.
Wildlife	Impact to wildlife is expected to be minimal as the project is likely to have insignificant incremental increases in noise and nocturnal lighting.	ME	Mitigation would likely be minimal.

Table D-A5. Summary of Phase 1 Environmental Evaluation for Folsom Dam Alternative (cont'd)

Resource Area	Potential Environmental Consequences	Magnitude of Effect	Mitigation Requirements/Avoidance Options
(e) Operations (cont'd)			
Fisheries	Anadromous and Resident Riverine Species – Changes in flow, water temperature, and reduced early lifestage salmon survival. (Note: Changes in the timing, magnitude and frequency of these parameters, as they occur throughout the CVP/SWP system, are unknown without hydrologic modeling.) Warmwater Reservoir Fisheries – Changes in reservoir water surface elevation and littoral habitat affecting spawning and rearing. Reservoirs under consideration include Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. Coldwater Reservoir Fisheries – Changes in reservoir storage impacting long-term population levels. Reservoirs under consideration include Shasta Reservoir, Keswick Reservoir, Trinity Reservoir, Oroville Reservoir, Folsom Reservoir, and Lake Natoma. There is a potential to increase the volume of effluent discharge to fish-bearing streams.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. Need to determine specifics of the operational pattern of the diversion (e.g., will water be withdrawn at a constant rate, will timing be annual or seasonal, what other conditions associated with the diversion could have an influence on CVP/SWP operations). This alternative's location in the watershed likely would result in greater potential impacts to riverine fisheries resources relative to alternatives along the Sacramento River and the Feather River. The entire 23-mile length of the lower American River is used by anadromous fish for migration, spawning, and rearing.
Water Quality	1) Reduced downstream dilution potential for pollutants and surface water quality parameters of concern; and 2) increased mobilization of groundwater contaminants.	ASN Unknown without hydrologic modeling; additional analysis required.	Not yet able to be identified. Because water quality in the lower American River is generally considered to be of better quality than water from the Sacramento River, potential water quality impacts from this alternative could be of greater consequence relative to other alternatives under consideration.
Recreation	None anticipated.	ME	None anticipated.
Land Use	None anticipated.	ME	None anticipated.
(f) Elkhorn/Elverta Module - See Elkhorn/Elverta Diversion Alternative			

Categories of potential magnitude of effects and mitigation:

LME Potentially Large Magnitude of Effect
ME Potentially Small Magnitude of Effect
ASN Additional Study Needed